

JACK HEATON

WIRELESS OPERATOR



A FREDERICK COLLINS



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JACK HEATON, WIRELESS OPERATOR



“‘BOYS, YOU HAVE DONE YOUR DUTY. NOW SAVE YOURSELVES’”—Page 50

JACK HEATON

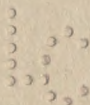
WIRELESS OPERATOR

BY

A. FREDERICK COLLINS

*Author of "Inventing for Boys," "Handicraft for Boys,"
"The Boys' Book of Submarines," etc.*

WITH EIGHT ILLUSTRATIONS BY
R. EMMETT OWEN



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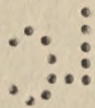
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TO
DONALD DELMAR ZEITLER

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CHAPTER I

HOW I LEARNED WIRELESS

IT happened out at sea about five hundred miles as wireless waves fly from Montclair. But perhaps you don't know where Montclair is and maybe you don't particularly care, but as it is my home town I must tell you about it. First, it's in New Jersey a short way from South Orange, where Mr. Edison, the great inventor, has his laboratory, and about twelve miles from New York City. So you see it is pretty favorably located.

If you were a stranger going through the place you'd have been surprised to see the webs of wires strung around every other house in town and on first sight you might have taken them for telegraph or telephone lines, or as I once heard a man remark to my father, "They

look like lines on which to hang the family wash." But, nay, nay, these wires, on the contrary, were not used for any such commonplace purpose but they were, instead, *aerials* put up by wireless boys for sending and receiving messages.

Just about half of the fellows in our town at that time were wireless bugs and they ranged anywhere from thirteen to nineteen years of age, though every once in a while a full fledged man would be found with an outfit. Some of the fellows had elaborate equipments with aerials containing upwards of a thousand feet of wire and with them they could send messages to distances of a hundred miles or so and receive them from powerful stations a thousand miles away.

I don't know who started the wireless game in Montclair, but I do know that it was a long time after I was exposed to the wireless geim that it *took* and I was interested enough to *listen in* to the news that was flashed out by ship and shore stations. Nearly all fellows begin wireless by seeing some of their pals monkeying with the apparatus, and no wonder, for wireless has a kind of fascination about it that makes a deep appeal to not only boys but men.

At that time I was fifteen years old and my hobby was printing. I had quite an outfit, including a 5 x 7 self-inking press, a good layout of type, cases and everything. As I was a boy of action and wanted quick results I couldn't see this idea at all of constantly adjusting a *detector*, working the slider of a *tuning coil* back and forth, looking as solemn as an owl and keeping as silent as a clam.

There was a friend of mine named Bob Carteret who had the top floor of the garage on his place and he had one of the best amateur outfits in town. A lot of us fellows used to make his operating room a *hang-out* because we could get into and out of it without disturbing any one or getting called down by anybody. Bob was a mighty good sport even if he did wear spectacles and talk like a college professor and he was always willing to let a fellow listen in if he could read Morse, while for the benefit of those like myself who didn't know the code he would tell us what the fellows in our own neighborhood were saying or what the operators down in Virginia, over in Ohio, up in New York State, or out in the Atlantic were sending.

It was interesting enough to pick bits of news

right out of the air, so to speak, and I noticed that the grown-up folks were always mighty keen to hear any wireless news that might happen to come Bob's way. In those good old days when amateur wireless was young any fellow could set up his own station, use whatever *wave length* he wanted to send with, and blab any news that chanced to come his way; but all this was changed a few years later when the government found that too many amateurs were abusing these privileges. To give them a chance it made every one who operated or owned a wireless station register it, gave him a call letter, limited the sending range of his apparatus, had him use waves of a certain length for sending, and made it an offense for him to give out any news which he might receive. And oh, the wail that went up all over the United States from the amateurs!

I went over to Bob's one evening after dinner—we always have dinner in the evening in Montclair—and as usual there was Bob sitting at his table listening in. Charlie Langdon, Howard Brice and Johnny James were there and they were all leaning over him looking worried.

"Hello, fellows," I sang out as I opened the door.

"Shut up," hissed Howard, while Johnny punched me in the ribs with his elbow and Charlie showed his butter teeth and flapped his open hand, which in kid language means *keep still*.

I sat down sulkily, for no self-respecting boy that can box the way I used to wants to be told to shut up, get a poke in the ribs and the signal to keep his face closed when he has only said, "Hello, fellows." After a minute or two my curiosity bristled up for I must needs know what was going on. I looked at Bob. His face was a little longer than usual, his eyes were glassy and stared hard and he kept adjusting the detector nervously.

"What's it all about, Howard?" I whispered in his ear.

Say, you'd think I'd committed a crime the way he scowled at me. Then he deigned to make a whispered reply.

"The *Republic* is sinking and is sending out C Q D's."

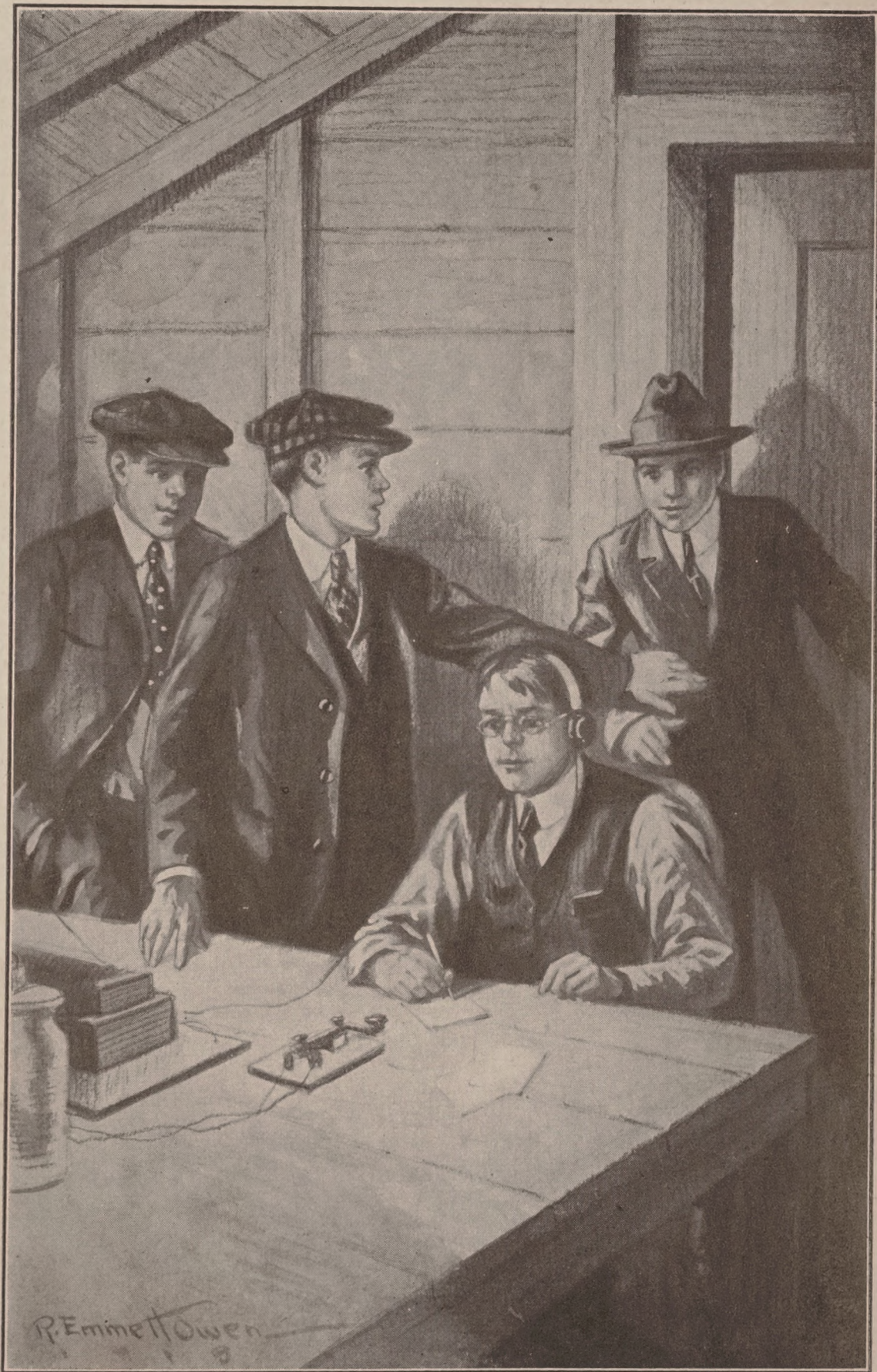
I could feel my heart stop beating, the blood leave my head, and my body get rigid, and it's

just about the same kind of a feeling that comes over a fellow when he is on a ship that is going down, as I have since learned.

Other ships were answering the *Republic's* distress signals and were headed for her but they were a long, long way off and it seemed very doubtful if they could reach her in time. The *Republic's* operator kept on sending C Q D's and then her latitude and longitude. I stayed at Bob's station until dad came after me, which was about midnight. At first he was pretty sore, but when he found out what had kept me he relented a little.

Well, the next day we wireless fellows—I had been initiated—did not take a very keen interest in our school work, for when you know a big ship crowded with human freight is sinking you don't care much whether school keeps or not. As soon as school was out we were all at it again and then after fifty-two hours of hoping against hope, and during all of which time Jack Binns, the first wireless hero, had stuck to his key on the ill-fated ship, help reached her and by so doing his duty sixteen hundred lives were saved.

Bob took the receivers from his head and laid them on the table. I tell you we were an



"'THE REPUBLIC IS SINKING AND IS SENDING OUT C Q D'S'."

—Page 5

excited crowd and it had us going for fair. We all felt as if we had really something to do with it, instead of merely getting the news at first hand. It was indeed a thrilling piece of business, and nothing more was needed for me to get into the wireless game except an outfit.

Now I don't know whether you know anything about wireless, but I will say here that while you can only send over short distances with a good sized sending apparatus, you can receive over quite long distances with a cheap receiver if you have a fairly decent aerial, by which I mean one that is high enough above the ground and has a long enough stretch, and, of course, it must be properly insulated. Not only this, but a sending apparatus of any size costs much money and takes a lot of current to work it. On the other hand a receiving apparatus can be bought for a few dollars and can be used without any current at all, though it gives louder signals when a dry cell is used.

Just as soon as my wireless pals found I'd got the *bug* they all jumped in and helped me *rig* up the aerial. We strung it up between a tree at the back end of our lot and the gable at the side of the house so that it was about fifteen feet high

at one end, thirty feet high at the other end and fifty feet long—a very respectable aerial.

We ran the *leading in* wire to the window of my printing office. Outside the window frame we screwed a *lightning switch*. Next we fastened the *rat-tail* of the aerial to one of the middle posts, and from the other lower post we ran a wire down to the ground and into the basement, where we clamped it on to the water pipe, and this made the *ground*. This done we connected the other end of the switch with a wire and ran it through an insulator in the window sash so that it could be fixed to the instruments when I got them.

“Won’t those wires attract the lightning, Jack?” my mother asked, eyeing it dubiously after the aerial was all up.

I was just about to tell her I had never thought of that, when Bob jumped in and explained it all as intelligently as though he were Sir Oliver Lodge lecturing on wireless before the Royal Society.

“You see, Mrs. Heaton,” he began, “an aerial when it is properly put up like this one really protects a house from lightning just as a lightning rod does, only better. Before a

storm the air is charged with electricity and as the aerial is connected with the ground through that switch up there, the electricity as fast as it is formed is carried to the ground and this prevents enough of it from gathering to make a lightning stroke."

Mother's eyes brightened hopefully as she looked on this smart boy.

"Isn't it wonderful!" she said, and went into the house perfectly satisfied that I was in good company.

The next move on my part was to get the receiving apparatus. This consisted of a *detector*, a *tuning coil*, a *dry cell*, a *potentiometer*, and a pair of *head telephone receivers* or head-phones as they are called for short. Bob helped me to make the detector because he said he could make a better detector than I could buy. When I got everything ready to *hook up* I was terribly nervous for I could hardly wait to try them out.

I had a diagram that Charlie gave me which showed exactly how the instruments were connected up, and as I wanted to be able to say "I did it myself," and without the advice or criticism of any of the fellows, I started to work on

it as soon as I got home. I used my imposing table to set the apparatus on and it was not long before I had it all wired up as per the diagram.

Verily I was a proud youth when I put on the head-phone, adjusted the detector and moved the slider of the tuning coil back and forth. I knew just how to do it because I had seen the other fellows make these same adjustments a thousand times.

"I can call spirits from the vasty deep," boasts Glendower in Shakespeare's play of "Henry IV."

"Why, so can I, or so can any man, but will they come when you do call for them?" retorts Hotspur.

That just about states my case, for I could adjust the detector and run the slider back and forth on the tuning coil and so can any one else, but to be able to get a message is quite another matter. But then perhaps, as I thought, no one was sending, so I telephoned over to Bob and asked him to send something and to send it slow. I went back to my receiver but try as I would I couldn't get a thing. Gee, but it was discouraging.

In about fifteen minutes Bob popped in and by this time I was right glad to see him. He looked over the apparatus, not like an amateur but like a professional operator, and saw to it that all of the wires were tight.

“You’ve got it connected up all right and we ought to get it. Somebody ought to be sending something.”

He put on the receiver and listened, but to no purpose. He looked perplexed. As he was listening and trying to adjust the receiver, he glanced out of the window.

“You’re a great operator, you are,” he said with a rueful countenance; “how do you suppose you’re going to get anything when you haven’t got your lightning switch closed?”

Well, from that day to this when anything goes wrong I always look first to see if all the switches are closed and the connections are tight.

“Ollie Nichols of South Orange is telling Eddie Powers to meet him at the Y. M. C. A., and have a swim,” he said with a grin.

Then he clapped the receiver on my head and I heard the signals coming in as plain as

day, only I didn't know what the fellows who were sending were talking about.

To make a long, and for me a most pleasant, story short I learned the *Continental Morse Code* which was used by all Marconi stations and when I got so I could read the *kid* stations in and around Montclair, I began to branch out and pick up the commercial stations.

In those early days, although it was only ten years ago, the regular operators didn't send as fast as they do now and this made it quite easy to read them. It was not many weeks before I could double discount Bob on receiving, but he was always a shark on the *theory* of the thing. What he didn't know about electric waves, electric oscillations, disruptive discharges, tuning open and closed circuits and all the rest of that deep stuff was, to my way of thinking, not worth knowing. Bob lived up to his reputation for he graduated from Princeton, got a Ph.D. degree, became a Captain in the Signal Corps of the Army and is now somewhere in France.

I was quite well satisfied for a long while just to *listen in*, but finally the novelty of the thing wore off and I felt that I must needs

send also. My first transmitter was made up of a one-inch spark coil, a Leyden jar condenser, a tuning coil, a key and a lot of dry cells. As I was now in possession of a complete station, when the other kid stations wanted me they used to signal J K H and these remained my call letters until the government took a hand in wireless. Thus it was I landed at last fairly and squarely in the amateur class.

My wireless proclivities were getting the better of my scholastic training and my folks were quite worried over and more than tired of it. So one sweet day dad and I had a long talk and he did the most of it.

“Wireless,” he said gently but firmly, “is a good horse if you don’t ride it to death, but that is just what you are doing. There isn’t a minute of the time you are in the house, when you are not eating or sleeping, that you haven’t got that pair of receivers glued to your ears.”

“But, dad, next to Bob, I get the highest marks in physics in my class and I’m nearly a year younger than he is too. Why I can tell the *prof* things he doesn’t know about the emis-

sion, propagation and reception of electromagnetic waves," I enthused, pulling off some of that heavy, theoretical stuff of Bob's.

"That is all very well," he came back, "and I'm glad you can talk so understandingly, at least to your father, but those big words are not getting you anywhere in algebra and that's the point at issue."

Then suddenly veering the subject he asked, "How far can you send a message with that coil apparatus there?"

"A couple of miles in daylight if the atmosphere is right and about twice that far at night if there is not too much interference. You see—"

"How much would an apparatus cost that had power enough to send say twenty miles?" he broke in.

"About fifty dollars, I guess," I made reply.

"Then let's strike a bargain. It's two months till school is out and if you will bend your efforts and pass everything—everything, mind you—I'll see to it that you have a sending outfit that's worth something."

"Dad, you're all right," I ejaculated, shaking his hand warmly.

“And you’re all right, too, Jack, if you’ll only speed up in your studies a bit.”

The result was that both dad and I made good. He was pleased with my work and I was tickled most to death with my new half-kilowatt transmitter. But that is what you call buying an education for a fellow twice. It’s a shabby trick to work on one’s folks and I’ve often thought about it since. The only way I can ease off my conscience is by considering that this mild kind of bribery has been worked by nearly all fond parents in one way or another ever since the world began.

Hardly had I installed my new transmitter than summer was upon us and we were rushing off for our annual vacation at the seashore. Not far from Asbury Park, where we were to spend the heated months, there was a Marconi station. I had a brilliant idea and to the end of trying it out, I made a box about four inches high, six inches wide and twelve inches long with a good lid to it and fitted it with hinges, clasps and a handle.

I arranged my receiving apparatus so that it would all go snugly into the box—that is, I made a portable receiver of it. Then I got a spool of

No. 18 copper wire, three or four porcelain knob insulators, a screw driver and a pair of pliers, and I was ready for business.

When we were inducted in our hotel, which was to be our home for the next couple of months, I strung the wire lengthwise across the roof, supporting it on the insulators. I brought the free end of the wire down the side of the hotel and into my room which was on the sixth floor. I connected the aerial wire to one of the binding posts of my portable receiver and the other binding post to the water pipe in the bath room. Talk about messages! Why I got them from all over New Jersey when the big stations were working.

Some one told the manager (I'll bet it was the elevator boy I had had the run-in with the first day I rode up with him) and he nearly spoilt everything, for he made me take the wire down. But I *foxed* him. I hooked the aerial end to a brass bed and with this arrangement I could get a couple of the nearest big stations, but of course not so clear and loud. Sometimes I could even pick up a coastwise steamer which carried the *United Wireless Company's* apparatus and on two or three occasions I had the

pleasure of listening to a conversation between two transatlantic liners. I suppose if the manager of the hotel had known about it, he'd have charged me extra for using the bed as an aerial.

It showed me, though, that there were great possibilities in wireless and that we may yet be able to talk with the inhabitants of Mars. I wanted to get into wireless deeper and I did.

CHAPTER II

MY FIRST JOB AS AN OPERATOR

JUST before the Christmas holidays my father, who was the New York manager of the *Singer Crude Oil Engine Company*, told mother and me that he had to make a business trip to Nicaragua.

There was nothing exciting in this announcement for dad went off on business trips quite often, but when he said that he would take us with him and we'd go by steamer I immediately sat up and took notice, for I had wanted to make a sea voyage ever since I could remember.

It may seem a little queer but although I lived almost within sight of the old Atlantic and picked up messages right along from coast liners, the only trip I had ever made was on a little steam launch that takes unwary pleasure victims from Asbury Park outbound toward Europe for about ten miles, or until every one's

gizzard is turned wrong-side-out (much to the delight of the fishes) and back again.

I said *every one* was sea-sick nigh unto death but as a matter of fact there were just three human beings aboard the *Snail* that were able to step ashore like sober folks and walk a fairly straight line. I don't want to do any bragging but these sole survivors of *mal-de-mer* were the captain and the engineer, who made up the crew, and yours truly.

To make a real ocean voyage on a sure enough steamer meant something more to me than just a sea-going trip, for a law had been passed some time before making it compulsory for all ocean passenger vessels to have a wireless outfit aboard and I was just *bugs* to see a regular ship set in operation.

For the next few days everything around home was a hurry-up place—like going away for the summer—and I was mighty glad when at last we took the Erie (not weary) railroad for Jersey City, where the *Pan-American Line* had its docks. Once there, a couple of porters relieved us of our numerous pieces of hand baggage, and trailing along in the rear of dad and mom, I came aboard feeling like a duke.

After we were shown our staterooms by the steward I made a bee-line for the wireless room, but found it locked, the operator not yet having put in an appearance. To kill time till he came I went up on the *hurricane deck*, that is the upper deck, to take a look at the aerial.

It was formed of a couple of parallel wires about 200 feet long suspended between the masts and insulated from them by *strain insulators* of the kind that was then known as the *Navy type*. I was standing close to one of the *funnels* looking up at the aerial, which seemed to me to be a middling one—I had seen better and worse in Montclair—when all of a sudden there was a terrific noise set up and for a second I failed to cohere—that is I was nearly scared stiff. In an instant my *jigger* was right again, for it was only the ship's whistle blowing its deep throated blast to let those who had come aboard to say good-by to their friends who were sailing, know that it was time to go ashore, and to those ashore who wanted to take the boat know that they had better get a move on them if they expected to make it.

When I got back to the wireless room there was quite a collection of people crowded around

the little window, but whether for the purpose of sending messages or out of curiosity I didn't know. I stood about as much chance of getting up to that window as a fellow has of getting on a subway express at Brooklyn Bridge during the rush hour.

I went away in disgust and didn't go back again until we had sailed down the river, passed through the Narrows and had dropped the pilot out at sea.

Suddenly I heard the *ze—ze—zip—zip—zippy* snap of the sparks of the transmitter as the operator began to send, and I rushed madly to the wireless room. As I ran down the passageway I read — — . — that is *B R T, B R T, B R T*, at intervals of every two or three minutes; *B R T* was the call letter of some shore station that the operator was trying to get, but without my book, which gave the call letters of the different ship and shore stations, I couldn't tell which one it was.

You know, of course, that when a vessel wants to talk to a station either on ship or shore the first thing the operator does is to *listen-in*—to make sure that he will not interfere with messages that are being exchanged between other

stations within his range. If the *ether* isn't too busy he then sends the call letter of the station he wants.

On reaching the wireless room I found a bigger crowd congregated around the window than ever for the *zip—zippy* crackle of the sparks as they broke down the air between the spark-gap *electrodes* had attracted the curious even as honey attracts insects of the *Musca domestica* family, i.e., houseflies, and I couldn't get within six feet of it.

There was a short lull while the operator looked over a message which a little man with red hair and a pepper and salt suit had written out. When the operator started to send again I read off the name of our ship, the state of the weather and the number of words he intended to send, all of which was in accordance with the regular routine prescribed by the rules and regulations of the company for governing communications by wireless between ships and shore stations. The message ran like this:

For fear you may not know the Morse code which was used by all coastwise steamers in those early days, I will do it into English for you.

... — — . | ... — — . | ... — — . || . V . — | . I . N . A |
 — L | . O . S . || . F . I . N . E || . F . I . F . T . E |
 . E | N . || — J . — . || D . . || B . . . | . R . O . — W | N . ||
 . — I — . | . . 2 . . || B . . . | . R . O . A | D . . | . W — | A . Y . ||
 — N . | . Y . . || . F . O . R . — G — . | . O . T || — M — | . O . N . |
 . E | . Y . . || . I . N . || . H . . | . A . S . T . E || . S . E | N . | D . . ||
 — T | . — W — | . O . || . H . . | . U — | N . | D . . | . R . E | D . . ||
 — D . . | . O . L | L | . A . R . S . || B . . . | . Y . . || . — W — | . I . |
 . R . | E | — L | E | S . S . || . R . E | S . | T || — B . . . | . Y . . ||
 — D . . | . R . | . A . F . T || . R . I . | . A | — L | — J — . | . O . ||
 . F . | . R . | . A | N . | K . — || — B . . . | . R . O . — W — | N . ||

S G, which I afterwards looked up, was, I found, a station at Sea Gate which was on the coast. *Vinalos* was the name of our ship. *Fine* meant the state of the weather. *Fifteen* indicated the number of words the message contained.

I laughed at the man who forgot, but nobody else laughed because there was probably not one among them who knew the difference between a binding post and an electric wave.

All of that afternoon I read the outgoing messages, but I felt I was losing something by not getting what was coming in. Then a bril-

liant idea struck me and I immediately proceeded to put it into execution with the result that it almost electrocuted me.

I took out my little portable receiving set, hooked a wire to the detector and the other end to the electric light fixture for a *ground* which, from what I had read about ship stations, I had reason to believe made a connection with the steel hull of the ship. Being so close to the 2 kilowatt (about $2\frac{1}{2}$ horsepower) transmitter, one side of the spark-gap of which also made connection with the hull, I hadn't the slightest doubt but that I could receive without an aerial and I certainly did, but the kind wasn't right.

No sooner had I put on my head-phones and my fingers on the adjusting screw of the detector than zip, zum, bang, boom, and I received a terrific shock that lifted me clear off the edge of my bunk; I hung suspended in mid-air 'tween decks (or so it seemed) and to give verisimilitude to the *levitation* act, I recoiled like a 12-inch gun and hit the floor with a dull thud. I was glad the man I laughed at because he forgot, was not there to laugh at the fellow who didn't know.

When I had fully come to and was able to use my thinker again I knocked the wire off of the electric light fixture and then proceeded to examine my receiver to see if anything had been damaged. Beyond burning off the point of my detector there was no scathe done, and I overhauled it and put the instrument back in its box.

My next move was to see the operator and hold some small wireless talk with him. It was now late in the afternoon and when I got back it overjoyed me to find that the crowd who hungered to penetrate the mystery of sending messages without wires had fathomed its very depths and departed, that is, all except one young couple who were from Missouri, according to the passenger list, and of course they must needs be shown.

The moment I saw the operator's face I set him down for one of those fresh young fellows you meet everywhere and I did not miss my guess. Now you would hardly believe it, but it is nevertheless true, that there are a few operators who think it smart and a great joke to tell land-lubbers anything but the truth whenever they are questioned about wireless.

“What I can’t understand,” said the young woman, “is how you can send out a wireless message when the wind is blowing so hard.”

If the operator had been even a 14-carat gentleman he would have told her that when he works the key a low pressure current of electricity is broken up into dots and dashes representing letters and that this intermittent current flowing through the coil of the transmitter is changed into high frequency oscillations by the spark; the oscillations then surge through the aerial wire and their energy is emitted from the aerial in the form of electric waves. These electric waves are exactly the same as light waves, except that they are very much longer, and both are transmitted by, in and through the *ether*. Hence the wind, which is air in motion, has nothing at all to do with it.

This would have been the real scientific explanation of how a message is sent and while it would, more than likely, have been as clear as mud to her young inquiring mind, still if she could not grasp the true explanation of how it works it would have been her misfortune and not the operator’s fault. See?

But did he tell the lady straight? You could have told from his *physiog* that he would not. Instead he went on at great length and framed up a story of how the wind had once blown a message he had sent far out of its course and then suddenly veering round it blew it back again and he caught his own message several minutes later when he was listening-in for the reply. This he claimed, with great seriousness was due to the low power of his instruments and a fouled aerial.

“Are you having any trouble now on account of the wind?” continued the young woman deeply interested.

“None at all, because you see I am using a four horsepower spark and I have just had my aerial sandpapered and oiled and the waves slip off without the slightest difficulty.”

This little speech gave me another shock, but I had a third one coming and forthwith got it.

“How are they coming in?” I asked, leaning against the window after the couple had gone.

“What do you mean?” he questioned as he looked at me through half closed eyes in a way I didn’t fancy.

“Why the messages?”

“Through the window,” he returned shortly, and went back to his key.

I stuck around the window and took a good look at the instruments which to my way of thinking weren't much, in fact a lot of fellows in Montclair had outfits that put his way in the shade except that they were not as powerful. I couldn't see why he was so *swelled* on himself.

He began calling again and after he had put through his message I repeated it out loud as though I was talking to myself, just to let him know that I knew.

He took off his head-phones, came over to the window and smiled a thin-lipped smile which was anything but friendly.

“So you're another one of those wireless kids, eh?”

“Yes, I have a pretty good wireless set. I live in Montclair and very often I hear Key West,” I told him with some pride.

The way he warmed up to me was something wonderful and in all my experience as an operator I have never met another of exactly his wave length.

“You kids,” he said, pointing his long bony finger at my right eye, “make life a nightmare for us professionals. Every kid that knows how to splice a wire seems to be crazy to send messages. Ninety-nine out of a hundred know nothing of wireless and their signals are simply a jumble of sparks.

“A kid has no business learning wireless at all. I can *tune out* amateur low power stations, but they are always breaking in in the middle of a message. I haven’t got any use for a wireless kid. So *hotfoot* it and don’t hang around here any more.”

This was too much for even a fellow with a cast-iron nerve like mine, so I turned on my heel, said *sore-head* under my breath and took a walk on the promenade deck. He was the first professional operator I had ever met and I was certainly disappointed in the way he treated a brother operator. I wondered then if all professional operators had his kind of a *grouch* and if so, I didn’t want to be one of them.

Not to be out-generaled I thought I’d try one more scheme and that was to use a couple of pieces of wire five or six feet long for the aerial and ground, hook them on to the detector of

my receiver, fix the free end of the aerial over the window and lay the free end of the ground wire on the floor. In this way there would be no direct metal connection between his transmitter and my receiver.

The waves from his set were so powerful that they easily bridged the gap and I listened-in whenever I wanted to and knew everybody's business on board all the way down to Realjo. But I kept away from the wireless room and that operator. Before we landed I found out from the second officer that the operator was only a substitute for the regular one and that it was the second trip he had ever made.

After a stay of a couple of weeks in Realjo we started back for New York on the *Almirante*. I didn't know whether to tackle making friends with the operator or not. I had swallowed a pretty bitter wireless pill on the way down and didn't care about repeating the dose.

The second day out I ventured close enough to the instrument room to see what the outfit looked like and to size up the operator in charge.

He was a big fellow with a full rounded face

and every little while he would whistle a popular air which fitted in nicely with the bright sunshine that flooded the room. At the same time he would listen-in and finally he sent O. K., which in the wireless code means that he had heard the operator of the distant station who was calling him and that he was ready to take his message.

Of course I couldn't tell what was coming in but I was aching to put those head-phones on just once. When he had finished writing out the message he put it in an envelope and started to leave the room. Spotting me standing by he beamed pleasantly.

“Oh! I say, boy, I wonder if you would be so kind and condescending as to take this message to the Captain? Some other messages are likely to come in and I don't want to leave my post.”

Would I carry a message to the Captain? Why I'd carry one to the King of Abyssinia for a pleasant word from any professional operator. I felt that there was my chance to get a stand-in with his royal highness, the wireless man.

After delivering the message to the Captain I returned with alacrity to the window of the wireless room. The operator loosened up but I didn't tell him I was one of those fellows too. I had learned at first hand that professional operators hadn't any use for wireless kids and that the only way to be friends with one was to be as dumb as a clam as far as wireless was concerned.

This scheme worked out fine for after some talk he asked me of his own accord if I'd like to take a look at the apparatus. He opened the door and told me to "come right in" although on a card tacked on the wall in plain sight was printed this legend:

Service Regulations for Operators.

- (1) The instrument room is strictly private. No strangers are allowed on the premises without a signed permit from the Managing Director.

And this was followed by a dozen or more other rules and regulations.

When I got inside the room the operator, whose name was Bathwick, began pointing out

which part of the apparatus was the sender and which made up the receiver; this was the key; that the sending tuning coil, over here the condenser; under the table the transformer; on the wall the spark-gap; and altogether these make up the transmitter. This the crystal detector, the potentiometer, the tuning coil, the variable condenser and the head-phones make up the receiver and, finally the aerial switch, or *throwover switch* as it is called, the purpose of which is to enable the operator to connect the aerial with the transmitter or the receiver, depending on whether he wants to send or to receive.

I acted as if I had never seen a wireless set before; all went well until he had finished and then I let the cat out of the bag. He had a peculiar kind of a loose-coupled tuning coil that I had never seen before and I asked him how it was *wound*. He grinned at me with his big mouth and blue eyes and put out his open hand, palm side up.

“Put it there, pal,” he said. “I was a wireless kid myself once.” We shook hands and it put me next to the fact that all professional operators are not alike and at the same time it

gave me a pass to the wireless room whenever I wanted it. I almost lived there the rest of the voyage.

Harry—I mean Bathwick—and I got so thick we began calling each other by our first names. He let me listen-in whenever I wanted to, and then after telling me all about the service regulations that had to do with the order in which the messages were sent, he let me try my hand at sending.

One night when we were off Cape Hatteras and a furious gale was blowing Harry got suddenly sick and as this is the worst part of the whole trip the Captain was in a quandary about his wireless messages. Harry told him that I could work the instruments and to put me in his place. The Captain seemed doubtful at first because of my age, but there was nothing else he could do.

Naturally I made a few mistakes but at that I was pretty successful and I had the distinction, so the Captain told my father, of being the youngest operator on board ship on record.

Well, the gist of it all was that when I graduated from High School in the spring and wanted a job as an operator I made application to the

United Wireless Company, which at that time controlled about all the coastwise steamers, and, armed with a letter of recommendation from Captain Harding of the *Almirante*, I got it on the good ship *Carlos Madino*.

The year I was the operator on this ship I visited many Central American ports. I became more and more imbued with the desire to see farther around the corners of the great round world and I think I can safely say I have done so in a fairly creditable manner.

CHAPTER III

WHEN THE *ANDALUSIAN* WENT DOWN

AS I have said, I was in the coastwise trade for nearly a year, and could *savvy* anything in English or Spanish, Morse or Continental, that the old-time operators were able to send. I had sent and received messages of every description and for every conceivable purpose.

Why, once a brother operator and I married a maid who was on board my ship to a man somewhere in Panama by wireless. Of course there was a minister at each end to help the ceremony along but it was we operators who really did it with our wireless sets.

Another time while we were running through a storm it was my pleasant duty to flash the tidings ashore that a stork had overtaken us and added two more to our passenger list, both consigned, to use a maritime term, to the same family.

The most exciting time I had while I was on the *Carlos Madino* was when we were taking a cargo of munitions to the Nicaraguan government and which we had orders to land at "Alvarada," the headquarters of the Army.

When we were within a day's run of that port I heard the call *CM CM CM* which was our ship. I sent my *O. K.*, and then got a message for the Captain which told him to land the cargo at "Grayville" as the insurgents were watching "Alvarada." It was signed Strada, Minister of War, Nicaragua.

I took this important message to the Captain myself and we were soon headed for "Grayville." Several other messages passed between the Captain and the Minister of War and it struck me that the signals were the strongest I had ever received for the distance covered; in fact they were strong enough for a 5 kilowatt transmitter instead of a 2 kilowatt transmitter which I knew was installed at the station at "Alvarada."

My first thought was that I had struck some highly sensitive spot on my crystal and I tested it out only to find that wherever I put the wire point on it the signals came in just as clear

and loud. I wondered. While I am not the seventh son of a son-of-a-gun nor do I claim any supernatural powers I got the *hunch* that down here in tropic waters where insurrections are the rule and not the exception all was not as it should be.

I told the Captain about it and while he didn't take much stock in the idea he had a search made of the ship. One of the room stewards reported that he had found an electric cord with a plug end hanging from a lamp socket in room 138. It might have been for an electric iron, for a hot-water heater or any one of a dozen other electric appliances, he said, but it looked suspicious.

A more thorough search of room 138, in which the Captain and I took part, revealed a heavy suit case under the bunk, which had a place to plug in the cord, another for the receivers, and a key—at least this was my theory. A strict watch was kept on the stateroom and I went back and sent *GA*, which was the call for “Alvarada” every few minutes.

In the course of fifteen minutes or so I got the *OK* of the operator at *GA*. The steward who had entered the stateroom adjoining the

one occupied by the suspect heard the faintest sounds of sparks coming from it. After this report I made a careful examination of my aerial and found that the *leading-in* wire from it which connected with my *aerial switch* had been cut while the end of the wire from my instruments had been connected to a wire so small it could scarcely be seen and this wire led to state-room 138.

After connecting my instruments to the aerial again I immediately got in touch with the station at "Alvarada" and learned that no orders had been given by the Minister of War to change our port of destination. The Captain had the protesting passenger put in irons to be turned over to the government officials of Nicaragua and thus it was that another small insurrection was knocked in the head.

I had filed an application with the *Marconi Company of America* for a job on one of their transatlantic ships; it was in for nearly three months and I had long since concluded that it and I were pigeonholed. My great ambition now was to get a berth on one of the big ships that crossed the pond. Various operators had told me that it was useless to try to get in with

the *Marconi Company* because the latter employed only operators who received their training in the Marconi wireless schools abroad.

Be that as it may on one of my return trips my father handed me a note from the Chief Engineer of the *Marconi Company* to see him. I did so and the result of that interview gave me the post of Chief Wireless officer of the s. s. *Andalusian*, one of the largest ships of the *Blue Star Line*.

Her route was between New York and Liverpool. Built by Harlan and Wolff of Belfast, Ireland, she was launched in 1901 and fitted for the transatlantic service in 1902. She was over 600 feet long, her breadth was nearly 70 feet and her depth was 40 feet. Talk about a ship, boy, the *Andalusian* was as far ahead of the *Carlos Madino* as that ship was ahead of a lifeboat.

The aerial of the *Andalusian* was formed of two wires 375 feet long and suspended between her top-gallant masts 200 feet above the sea and were held apart by two 8-foot spreaders. She was one of the first ships to be fitted with wireless and her wireless room was a specially

built room on the port side of the forward saloon deck.

Although the apparatus was of the old Marconi type, having been installed when the ship was built, we could send from 300 to 400 miles with it and receive four times that distance. The transmitter was formed of two 10 inch induction coils the primaries of which were connected in series and the secondaries in parallel so that while the length of the spark was still 10 inches it was twice as fat and hence proportionately more powerful.

There was a *jigger*, as Marconi called his tuning coil, and a battery of 18 Leyden jars made up the condenser for tuning the sending circuits. It was also fitted with a new kind of a key invented by Sammis who was at that time the chief engineer of the *Marconi Company of America*.

He called it a *changeover switch* but it was really a key and an aerial switch combined. In order to connect the receiver with the aerial all you had to do was to turn the key, which was on a pivot, to the right. When the key was turned it also cut off the current from the

transmitter by breaking the sliding contact between them.

To throw on the transmitter and cut off the receiver you simply turned the key back to its normal position and this made the connection between the aerial and tuning coil and at the same time it closed the circuit connecting the source of current with the induction coils.

The up-to-date feature of this set was the storage battery which provided an auxiliary source of current so that in the event of the ship becoming disabled and water flooding the engine room, which would put the dynamo out of commission, the storage battery in the operating room could be thrown in and *C Q D* could be sent out as long as the wireless room remained above water. This was a mighty good piece of hindsight, for ships that might otherwise have been saved by wireless had gone down at sea with passengers, crew and cargo simply because the dynamos were drowned out.

The receiver was different from the one I used on the *Carlos Madino* for instead of a *crystal detector* we had a *magnetic detector* which Marconi had recently invented. While the magnetic detector was not nearly as sensi-

tive as a crystal detector when you found a sensitive spot on the latter, still there were no adjustments to be constantly made as with the former.

Now I've told you something about the ship and her wireless equipment and right here I want to introduce Algernon Percy Jeems, Second Wireless Officer of the *Andalusian* and my assistant. Perce, as I called him, looked his name and lived up to it. He was as thoroughbred a gentleman as ever worked a key.

He wasn't very big in body—only 5 foot 4—and he was of very frail build but he proved to be a giant when it came to sheer bravery and as for meeting death when duty called he was absolutely unafraid. In fact when he saw the grim old reaper bearing down on him he went out of his way to grasp him by the hand and said: "When I get through with this message I'll be ready to go with you." And he did!

Before I tell you what happened to the *Andalusian* and of the heroic nerve of Jeems, I want you to know what *C Q D* means and how it came to be used as a distress signal. It was not until Jack Binns, who stuck to his key for 52 hours on the ill-fated *Republic* and by so do-

ing saved the lives of 1600 passengers and crew on board that *C Q D* came to be known the world over as a distress signal.

In the *Continental code*, which is used all over Europe by the wire telegraph lines, *C Q* means that every operator on the line shall give attention to the message which is to follow. It was natural then that when wireless apparatus began to be installed on ships that the *Continental code* should be the one used. *C Q* was the call signal employed to mean that every operator was to give attention to the message to follow, just as in the wire systems, or as it is said on shipboard to *stand by*.

Then the *Marconi Company* added the letter *D* which means danger, hence *C Q D* means *stand by danger* and when this signal is received by an operator at sea, no matter how important the message that he is sending or receiving may be, he drops it at once and answers the *C Q D* signal to find out what the trouble is.

Now to go on with the story: We sailed from Liverpool about noon on the 15th of March for New York with a full passenger list and a valuable cargo. The first couple of days out the weather was fairly decent but as usual at

this time of the year we ran into a real winter gale. We were struck time and again by mountainous seas. One gigantic wave that broke over her bow tore away a part of the bridge, others poured through ventilators and nearly every time she was hit more damage was done. To make matters worse the high winds drove us out of our course.

Although a sharp watch was kept it was so dark at night the lookout couldn't see his hand an arm's length before his eyes though he might have been able to see a ship's lights ahead had one been bearing down on us. As the Captain had been on the bridge continuously for three days and nights I felt it was my duty as the first wireless officer to stick to my key, and though it was Perce's watch I told him to turn in.

About midnight I heard the hull scrape against something that sounded as though she'd struck bottom when crossing a bar, or perhaps it was an iceberg. She keeled over until I thought she was a goner but straining and giving in every part of her superstructure she gradually rolled back and righted herself again.

The saloon and second cabin passengers came

tumbling out of their rooms in nighties and pajamas but what they lacked in clothes they made up in life preservers. Wherever you find danger there you will find among the panic-stricken a few cool, calm and collected men and women and sure enough two or three men and as many women appeared a few minutes later fully dressed and ready for anything that might happen. The officers assured all hands that nothing had or could happen and nearly all of them returned to their rooms.

The third class passengers were locked in the steerage and here pandemonium reigned. They pounded on the hatchways and demanded that they be allowed to go on deck; they were scared stiff. Like the other and more fortunate passengers they were soon quieted by cool headed stewards and returned to their miserable quarters in the fo'cas'le.

Within the next couple of hours one of the assistant engineers discovered that the seams of the hull had parted aft and the water was pouring into her hold. The Captain ordered all the bulkhead doors closed, to keep the water out of the other compartments, and her great pumps going, but once started the mighty pres-

sure of the intrushing water ripped her seams farther along and broadened the gap. Knowing she could not stay afloat for any great length of time the Captain ordered me to send out the call for help and to be quick about it.

I got busy with the key sending out *C Q D C Q D C Q D* listening-in between the calls as I never listened before to get an *O K* to my signals. It seemed as if all the operators were either asleep, dead or on the other side of the Equator, but after an eternity of time—which probably amounted to as much as five minutes by the clock—I caught the signal *O K* and then, “what’s up, old man.”

It was the s. s. *Arapahoe* that had answered and I was nearly frantic with joy for I felt that all of the responsibility for saving those 1200 souls on board rested entirely on me. I sent back the name of our ship, told him we were fast sinking, gave our latitude and longitude so that the *Arapahoe* would know where to find us if by good fortune we were still afloat when she reached us and, I added “for God’s sake put on all speed.”

In the meantime all the passengers had been notified, told to dress and to put on their life

preservers while the sailors had been ordered to man the life-boats. When the passengers came on deck the situation was calmly explained to them together with the hopeful information that three steamers were bound for us as fast as steam could carry them for I had got the *O K* from two others—the *Morocco* and the *Carlisle*.

There was, on the whole, very little excitement now among the saloon and second-class passengers, and, curiously enough, I observed that those who had been seasick nigh unto death seemed to forget their ailment in the face of danger and had their sea-legs on well enough to look after their own safety. It proves, I think, that seasickness is largely a matter of an exaggerated imagination plus a lack of will power.

Before the hatches were opened to let the steerage passengers out of their hole and on to the lower deck the Captain and one of his officers took their places on the main deck forward where they could watch every move the poor frightened mob made. They came helter-skelter up the hatchways falling all over themselves and everybody else, but when they saw

the Captain and the officer towering above them each with a brace of horse-pistols leveled at them like young cannon they eased off a bit their desire to be saved at the expense of others and the stewards had no further trouble with them.

Just then Perce got awake and hearing the gruff orders of the officers, the throbbing of the big pumps and the loud and excited talk of the passengers, he wanted to know the cause of it.

“The ship is sinking! so get up right away,” I exclaimed as evenly as my voice would let me and working the key for dear life.

“Oh, she is, is she,” he yawned as if it was an every-day occurrence. There was no excitability in Perce’s makeup.

Well, sir, we kept her afloat until daylight when the Captain ordered every one to the life-boats, women and children first.

Perce and I stuck to our instruments, keeping the ether busy and every now and then sending out cheery bulletins to the passengers, the gist of them all being that help was almost at hand.

I could feel the ship begin to settle and the life-boats loaded to the gunwales with their cargo of human freight, were quickly lowered into the running sea. It required great seaman-

ship to do this and even then one or two of them were capsized.

The Captain suddenly appeared before our window.

“Boys, you have done your duty. Now save yourselves,” and with that he was gone.

I could feel her nose pointing up in the air and I knew she was going down stern-end on. It was only a question of minutes.

“Go on, Perce. I’ll stick here.”

“Go on yourself,” he replied; “if any one stays I will.”

I don’t know exactly what happened but something flying through the air must have hit me, for the next thing I knew I had struck the icy water and had gone down several fathoms. The sudden ducking revived me and when I came up I swam for an overcrowded life-boat. The bos’n pulled me in and a woman’s voice whispered, “Thank God, he’s saved!”

There on the edge of the horizon I could see the dim outline of a ship with a great black stream of smoke in her wake and I knew her for the *Arapahoe* at last.

“Where’s the little operator?” a man asked me.

The bos'n pointed to the fast sinking ship, the bow end only of which was out of the water, and said, "There he is, sir!"

And as we looked we saw big brave Captain Stacey and little heroic Perce with their right hands clasped and with the Captain's left hand on Perce's shoulder, just as two old friends might greet each other on Broadway or the Strand, who had not met for a long time.

An instant later the great ship sank from sight leaving a momentary whirlpool, due to the suction of it, in the water.

The *Arapahoe* reached us an hour later and stood by and considering the heavy seaway and the wind, which though it had somewhat abated was still blowing half a gale, picked up the survivors and then proceeded on her way.

The passengers made a good deal over me and, since I am only human, I should have enjoyed their worship immensely, but while I had done my duty I knew it was Perce who was the real hero and I told them so.

CHAPTER IV

CATCHING SEALS BY WIRELESS

WHAT did I do when I got back, did you say? Well, after the sinking of the *Andalusian* my folks thought I ought to be willing to give up the sea and confine my adventures to Montclair, the Lackawanna Railroad and New York, and they urged me to settle down and sell engines, or get into some other kind of business in the big town and commute like the rest of the suburbanites.

I tried it for a few months but the air is dead on land and it stifles me like poison-gas when I breathe it, and besides, I kept hearing the call of the sea oftener and oftener and louder and louder just as though a spook mermaid were holding a conch shell to my ear.

Well, sir, there were just no two ways about it. I was not cut out for a salesman but I could handle a key with the best of them. So one

bright day—it was the first of March—when dad told me to go out and see a *prospect* who wanted a 40 horse-power crude oil engine, I made one stone kill two sparrows and after fencing with the would-be buyer for half an hour I slipped over to the *Lord's Court Building* where the *Marconi Company* had their offices and talked with my friend Sammis, the Chief Engineer.

“No, there isn't anything you'd want just now,” he reflected. “There's a couple of new ships building in Belfast for the *Cunard Line* and one of them will be launched in a couple of months. I might be able to get a berth for you on her.”

“I want to go right now if I go at all,” I told him, for the land ached in my bones like the old Harry and I knew the only way I could get relief was to go to sea.

“How would you like to go on a seal catching expedition to the Arctic? It ought to be a pretty good health trip for an overworked salesman. The *Polar Bear* and *Midnight Sun* sail in a couple of weeks from St. Johns, Newfoundland, to be gone for a month or so and the pay is double that of any operator in the trans-

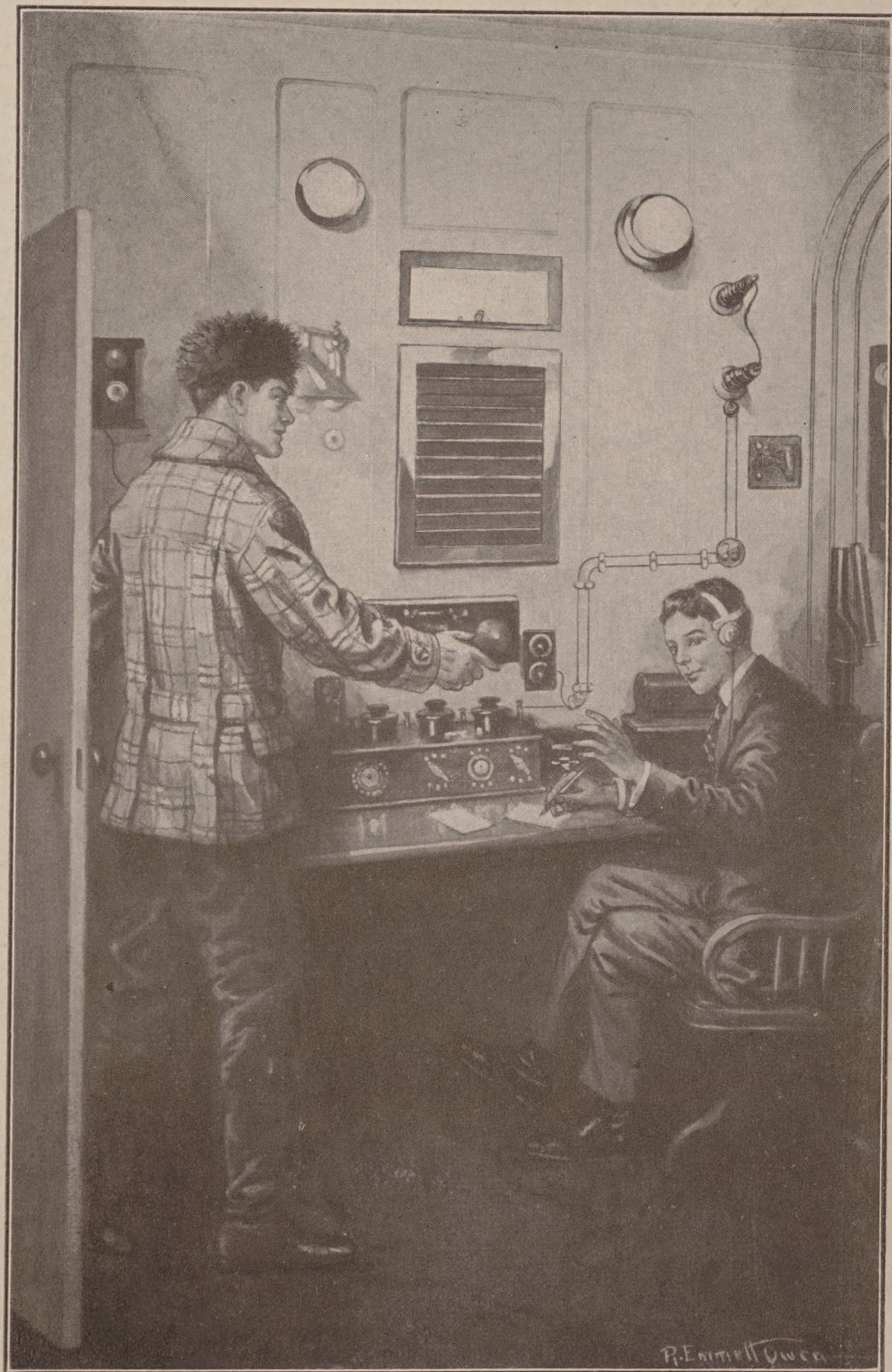
atlantic service. I have just shipped an operator named Mackey up there and gave him the post on the *Midnight Sun* so you'll have company, for they will sail together. If you'll take it I'll try to get you a good berth in the meantime."

"To the Arctic," I ejaculated. "Well, Sammis, this is a voyage I'll have to sleep over, but it sounds good to me. I'll let you know in the morning."

There wasn't the slightest doubt in my mind but that I'd take it but I didn't know exactly what my folks would say about it, for their idea was that they had had enough of my going to sea and they further thought that I ought now to be perfectly satisfied to stay on land for the rest of my natural life.

Do you know that when I stepped out of the *Lord's Court Building* after having signed up the next day I could feel the stone sidewalk rolling under me like the deck of a ship and that the putrid air of Wall Street smelled as if it had a dash of sea salt in it. That's how great I felt. Dad would have to get some one else to sell his engines—it was the Arctic for me!

On arriving at St. Johns I at once hunted up



Captain James of the *Polar Bear* and handed him my commission. *And such a captain he was!* He looked a different race of seafaring men from the captains I had seen in the regular Atlantic service.

His grizzled hair and beard and clear, keen eyes were gray; that part of his face which showed was about two shades lighter than the color of dried walrus meat and with his silence—except when any of the crew failed in his duties—you would have known, even if you'd met him on Broadway, that his home was somewhere inside the Arctic Circle. He turned me over to his first mate who also looked as if he had a heart of oak and would be equal to any duty he might be called on to perform if it was north of latitude 75 degrees, the latitude at St. Johns.

And, oh, the crew! They were cutters of the old school, every one of them. I had no idea that sailors of their kind were to be found anywhere at this time here on earth except in song and story, but there they actually were all about me in the living flesh. There was an air about them that told as plainly as spoken words they had weathered many a polar storm and that now, even at St. Johns, they were way too far

south of the bleak, frozen regions to be in their element.

And say, the ship! She was a beaut of the old wooden kind, not a whole lot to look at, but built to stand the strains of furious gales as well as the tremendous pressures of the ice packs. Indeed, she had been one of Commander Peary's ships which had been farthest north when that explorer sought to find the North Pole some years before.

The wireless apparatus and I were the only objects on the ship that seemed not to belong to her, but when we reached the sealing grounds we found ourselves and helped in the catch, thereby making friends with the Captain and his crew.

The transmitter was formed of a single ten inch induction coil which was energized by a current of the ship's dynamo. The receiver was of the regular Marconi type with a magnetic detector. The masts of the *Polar Bear* were only fifty feet apart and an aerial made up of half-a-dozen wires swung between them.

Whoever installed the equipment stopped at the aerial for there was no *ground*. It was no small job to get a decent *ground* for the ship,

as I have said before, was an old-timer and had a wooden hull. Now where a ship has a steel hull all you've got to do to make a *ground* is to simply connect the ground wire to a water pipe, or any other metal part of the ship, for these lead to the steel hull; as the hull sets in the water the very best kind of a *ground* is had without any trouble to get it. But what's to be done when there's nothing but an old-fashioned wooden hull between your instruments and the water? The way I did it was to run a wire from the instruments down to the engine room; then the assistant engineer fixed a 6 x 6 x 24 inch block of wood parallel with and close to the propeller shaft; this done we screwed a copper *brush*, that is a strip of stiff sheet copper, to the block so that it pressed flat on and hard against the shaft.

Under the head of one of the screws I looped the free end of my ground wire and screwed it down tight. This made a good enough ground connection through the shaft and the propeller keyed to it which was submerged in the water. With this transmitter, aerial and ground, I could cover 100 miles or so when the conditions were favorable.

Everything was hustle and bustle on board and all around us, for at that time of the year—it was nearing the middle of March—a score or more of ships steam from St. Johns along the great Labrador Coast to the frozen north where the young *harp seals* are found by the thousands on the ice floes off the coast.

Of all the ships at St. Johns I saw only one other that was fitted with an aerial and when I got my apparatus in order I made my way over to her to see Mackey, her operator.

In days gone by the sealing ships were all schooners and just as these gave way to wooden steamers so the latter will be supplanted by ships with steel hulls, and the *Midnight Sun* was the first of these fine new steel craft. For size and power she put it all over the *Polar Bear*, but she lacked the glamor of romance and for this reason I liked my ship the best.

I had met Mackey, her operator, at Liverpool once and we straightway became better acquainted. He told me that the firm who owned the *Polar Bear* also owned the *Midnight Sun* and that the Captains of them were to work together. A new experiment was to be tried, he said, and that was to catch seals by wireless,

but what the *modus operandi* of the scheme was he hadn't the faintest idea and no more had I. I remember when I was a little boy that folks talked about running street cars by electricity and I wondered how it could be done. I had a kind of a vague notion that a chunk of electricity came along, struck the car and pushed it ahead just as a breeze fills the sails of a ship and carries her for'ard.

In after years I learned that the current of electricity flowed along a wire parallel with the tracks and that it passed from this feeder to the trolley of a car, thence down a conductor to a motor which it energized and finally back to the power house through the rails; further that it was the power of the motor thus developed which drove the wheels of the car; and I was disappointed, for it seemed to me to be altogether too round-about a way—too far-fetched—to justify the statement that the “car runs by electricity.”

The same thing holds good when you see signs which read, “*hats cleaned by electricity*,” “*eggs hatched by electricity*” and “*diamonds made by electricity*,” for the hat is merely rotated by an electric motor, the eggs are hatched

in an incubator which is heated by a current flowing through a wire, and the diamonds are made in an electric furnace.

Now catching seals by wireless was to my mind quite a vague, mysterious and altogether a difficult proposition to see into—even as running a car by electricity was when I was a little shaver. Seals are wonderful creatures, as you will admit if you ever saw them do a balancing act in a show, and I have heard that they have a great liking for music. A seal hunter can take a phonograph, put a band record on it, set it up where there is a patch of seals and start it going. The seals will come out of the water to listen to the sweet strains and every time one puts its nose above the surface the hunter, who is lying a little way off, will shoot it with his rifle. This then is what you might call *hunting seals with music*.

It looked to me as if we might be told to send out a line of wireless waves to a patch of seals, bend up the ends of a few dashes and when the seals had swallowed them the sailors would heave ho and pull them aboard. But no, catching seals by wireless was not done in quite so direct a fashion, as you will presently see.

We only made one stop after we left St. Johns and that was at Cartwright, near the mouth of the Hamilton River, on the bleak coast of Labrador. And wireless, let me say right here, has been a big factor in changing life, such as it is, in this wild, forbidding country.

Labrador, you know, is a narrow strip of coastland along the edge of the province of Quebec. It is from 10 to 50 miles wide, but a thousand miles long, reaching from Belle Isle Strait which separates the lower end of it from Newfoundland to Hudson Strait which lies within the Arctic Circle.

The inhabitants live only on the coast and these are made up chiefly of Eskimos in the north and Indians in the south, and all along and in between are trappers, fishermen and *live yeres*. The trappers push into the interior a little way to run their lines of traps and in the spring of the year thousands of fishermen come up from Newfoundland to take the cod-fish, which abound off the coast at this season of the year. If you ask one of the poor, ignorant white inhabitants about himself he will say that he *lives yere*, hence the nick-name of this fixed part of the population. The condi-

tion of all these poor, simple folk has been much improved by wireless.

For many years the mail-boat was the only steamer that made calls at all the ports along the coast and she did this about every six months. If any one wanted to get something from St. Johns he had to know it a long way ahead of time and even when he was thoughtful enough to order it the chances are that by the time it reached him he had forgotten he had ordered it or had gotten over wanting it.

On the mail-boat there was a doctor and the inhabitants had to wait to get sick until he came, or perhaps, it would be stating the case a little more accurately to say that however ill they might be they had to wait until he came before they could be treated. Anything might and often did happen to his patients between calls. But all this has been changed by wireless which now links up the towns along the coast with Battle Harbor where the *Royal Deep Sea Mission* has its hospital for fishermen, and not only may supplies be ordered but, what is of far greater importance, the sick may have their diseases diagnosed and medicine prescribed though they are as far away as Maine, by the

doctor in charge and all in the twinkling of an electric wave.

As we steamed up the coast the ice fields began to loom up and as far as the eye could reach they glittered and sparkled like gigantic jewels under the glare of the Arctic sun. When night came on and the stars came out they shone a hundred fold brighter than in the temperate zone and the pale blue moon illuminated the scene with a kind of a supernatural light that seemed not to belong to earth.

But all the days and nights were by no means fine ones, for howling gales and fierce snow storms continually sprang up and I often wondered how a ship built and sailed by the hands of men, could weather them out. It was a man's work! On such occasions I stuck to my wireless room which I found mighty comfortable and trusted to the Captain and his mates to see the ship safely through.

As we got farther and farther north the *Aurora borealis*, or northern lights as it is called, grew brighter and brighter every night until the whole heavens in the region of the North Pole were scintillating with streamers that spread out like a great fan, reaching over

our heads and far to the south. The first mate said that it was as brilliant an aurora as he had ever seen and his explanation of it was that the spots on the sun had been unusually large and numerous.

Not only did the sun's activity show itself in the aurora, but it set up a violent magnetic storm on earth and this made the compass needles oscillate to and fro as much as $1\frac{1}{2}$ degrees on each side of their normal positions. Now magnetic storms always interfere very seriously with the operation of both overland telegraph lines and cable systems where the circuit is completed through the earth.

I had heard some one say, or had read somewhere, that a magnetic storm would interfere in the same way with wireless messages and I was fearful for some time that it would put our signals out of commission. But all through the magnetic storm Mackey and I sent our messages without the slightest trouble—indeed if we had not been told that a magnetic storm was on we should never have guessed it. Evidently wireless had scored another point over the wire systems and another pet theory was put on the ice to cool.

We sailed up the coast keeping pretty close to it while the *Midnight Sun* steamed up and out from it until we were fifty or more miles apart. Now here is where wireless came in, in catching seals. Over the constantly broadening gap between our ships Mackey and I kept their Captains right in touch with each other.

The Captain of his ship *wirelessly* that there were any number of old seals about him and this showed, the first mate told me, that there were patches of *white coats*, as the young harp-seals are called, somewhere in the neighborhood.

Our ship immediately headed in his direction and a night's steaming brought us within a few miles of the *Midnight Sun*, but we did not see any white coats either. But after we scouted around for five or six hours we sighted a patch of hundreds upon hundreds of little seal babies basking on the ice floes in the sun. My Captain ordered me to signal the good news of our find to the Captain of the *Midnight Sun*; he in turn steamed at once for our ship and when she came up the killing began.

These seals are called *harp-seals* because they have brownish yellow bodies and on the back of

each one is a big black mark like a harp. The old harp-seals start from way up north of Melville Sound in the early part of the winter and by March they are off the Labrador coast. There tens of thousands of them herd together on the drifting ice when the little *white-coats*, as the baby seals are called because their fur is so white, are born and, curiously enough, nearly all of them are born on the same day.

It was a great sight to see these fat roly-poly baby seals lying on their backs on the drifting ice and using their flippers to fan themselves with to keep cool.

A few days later the ships were so close to each other that Mackey and I visited back and forth across the ice while the crews were busy taking the seals. When we headed for St. Johns we had on board our ship more than twenty-five thousand sealskins, which was as big a load as we could carry, while the *Midnight Sun* had nearly fifty thousand and together we broke all previous records.

This being the case these hardened Arctic Captains were as tickled as a couple of sea-urchins and both agreed that wireless was the

greatest sealing scheme introduced since steamers took the place of schooners.

Before we bore up for St. Johns there were great doings on board both ships. Rockets were fired in lieu of regular fireworks and Mackey, having the most powerful set, sent a message to old *Boreas* and old *Arcticus* who are pioneers in the refrigerating business, and if the *North Pole* has an aerial suspended from it and the latter has a receiver attached to it, I doubt not but that they listened-in to the first wireless signals ever sent within the polar circle; if so, they heard some mighty fine things said about themselves and the glorious, though, withal frigid, country they rule over.

I wouldn't have missed that experience for a million dollars—what's that?—well, not for a hundred dollars in real money anyway.

CHAPTER V

MY ADVENTURES IN THE TROPICS

WHEN Bert Mackey and I got back to New York we were both in the same boat—to wit, we were without jobs. On the way down, though, Bert unfolded a very alluring scheme by which we could, he allowed, make *oodles* of money and at the same time stand a chance of meeting with something that looked like real adventure.

“Do you know, Jack,” Bert said confidentially, “that I went into the wireless game simply because it appeared to me to offer the best chance of meeting Miss Adventure. I’ve been at it for five years now and I’ve never even had the pleasure of getting a look at her face.

“Wherever I go she is always on the other side of the street and although I tip my hat to her she never looks up, much less gives me a *tumble*. I took that sealing job because

I certainly thought I'd meet Miss Adventure somewhere among the ice floes and blizzards of the Arctic North. But no! all I did was to sit in my cabin and send what my Captain wanted to tell your Captain and receive what your Captain had to say to my Captain. And to what purpose? So that a few rich men could get richer by enabling vain women to run around the streets of New York and a few other big burghs bedecked out in the skins of baby seals that had been clubbed to death. Now that's big business for men and women to be in, isn't it?

"I wish I could get a job on a pirate ship or start a revolution in some punk Central American country. And it's funny," he went on complainingly, "how a fellow like you, who has only been in the service a couple of years, could meet with a big adventure like the sinking of the *Andalusian*. I'd have given a year of my life to have been in your place.

"Now down along the Amazon River there are great rubber plantations, savage tribes of Indians, tigers, monkeys, boa-constrictors and all the garnishings that go to make up a first class tropical jungle. I know a man in New

York that does business with a rubber concern in Para, Brazil and he told me, just before we sailed north, that the *Compagnie Francaise de Telegraphie sans Fil* had a contract to put up half a dozen wireless stations along the river.

“It strikes me, Jack, that it would be a good scheme if you and I took a trip down there and looked over the ground. What do you say?”

Having a few dollars in my pocket and nothing else to do at that particular moment I said O K and agreed to join him provided we could get free transportation on some liner going down there. Bert assured me that he could *fix it* and he was as good as his word.

So it was we sailed in due time on the *Ceara* of the *Holliday Line*. It was an old tub that stood every chance of having on board Miss Adventure and I didn't doubt in the least but that Bert would have ample opportunity to strike up an acquaintance with her and to swim back, if he got back at all, for the *Ceara* had no wireless equipment—such was her regard for the laws of the U. S.

As luck would have it we had fine weather and she beat her way down just as she had for the last quarter of a century if she was as old

as she looked. We enjoyed the trip, at that, for there were not many passengers aboard and all of them, especially the South Americans, were very pleasant people. Having learned that we had never been in South America we were told that it was a great country full of possibilities for young men with some capital but that if we were unacquainted there it would be better for us to *about face* at Para and go home.

Bert and I had other thoughts on the subject but as we were nearing the Equator I kind of wondered why I had not staid at home selling crude-oil engines or taking the post on the new *Cunarder* that Sammis said he'd get for me, or doing something else that was nice and cool.

In a little less than a month's time we landed at Para, as it is popularly called, or Belem, as it is more properly called, or to give it its full name *Santa Maria de Del Belem do Para*. Just as New Orleans is built back from the Gulf of Mexico, on the Mississippi River so Para is situated a hundred miles inland from the Atlantic on the Amazon River. So this is Para from which Para rubber comes, thought I

as I looked about, and indeed I should have known it had I sailed into port with my eyes shut for the smell of rubber everywhere permeated the air.

But don't think for a moment that it is made up of a lot of adobe houses as so many Mexican towns are. Far from it, for in architecture it is a miniature reproduction of Rio de Janeiro, which city in turn looks more like Paris than any other in either North or South America. Nor is Para a small burg, for it has a population of a hundred thousand now and some day, if the Amazon valley is ever developed, it may be larger than Rio de Janeiro, aye, even than New York itself.

Different from the equatorial city I expected to find, where every one had nothing to do but to lie under a palm tree, look at the blue sky, smoke cigarettes and agitate the air with a fan, there was much to do, for there rubber is King, and the white, yellow and black folks were doing it with a good deal of vim too. The demand for rubber, we learned, was greater than it had ever been before and consequently the people were prosperous and happy.

After a deal of searching we located the of-

fices of the *Compagnie Francaise de Telegraphie sans Fil* and Bert explained to Señor Benoit, the manager, that we were a couple of wireless operators from the United States. The manager acted as though he was dazed and Bert handed him our credentials to set him right.

In a moment, though, he recovered and I wish you could have seen the way he greeted us! You'd have thought he'd found two long lost brothers for he hugged us in turn and almost wept on our necks. I thought the heat and the smell of the rubber had made him *nutty* whereas it was only his great good luck. Believe me, he knew exactly what it was all about.

He had come on from France six months before to put up a chain of wireless stations beginning at Para and on up the river for 2500 miles to Equitos, at intervals of about 500 miles. Before the wireless men got to Jurutty they had been taken down with the fever and were even then on their way to Para, and so the job was open and ready for us to tackle. He agreed to pay us a million *reis*, including all our expenses and a million *reis* for every month we remained as operators in his company's service. It didn't take half-an-eye to see that if we

could stick it out for a few months we'd be regular millionaires.

“I want to make our wireless system a success to show the Brazilian capitalists its superiority over the wire system. They have an overhead line stretched along the banks of the river but it gives very poor service for any one of a number of reasons, chief among them being that it is hard to keep iron wires from rusting away owing to the great amount of rain, and when copper wire is used the Indians have a great liking for it and cut out a length here and there whenever they want it.

“With wireless it is different and if I can only get the stations set up and working I will show the advantages of it over the wire system very quickly. Wireless will be safer and surer for the rains can't affect it and I am quite sure the Indians will not steal the ether.”

We took passage on the *Asuncion*, one of the *Amazon Steamship Company's* fleet of small steamers and sailed up the Rio Amazonia, or as we call it the Amazon River, the mightiest of all flowing waters. On either side of it for hundreds of miles lay a tangled mass of tropical vegetation—the jungle in very truth. The vil-

lages were far between but occasionally we saw the rude huts of a few settlers who had come forth from the civilized quarters of the world to sap out their energies and make their fortunes in rubber.

We were told that a mighty small area of the jungle had been explored though a few expeditions had made their devious ways through some parts of it either for scientific purposes, such as studying the vegetation and living things, or for commercial reasons as getting plants for medicines and more frequently rubber.

And rain! I can't remember a day down there when it didn't rain. The reason it rains so much is this: the warm winds that blow up the river from the Atlantic carry a lot of moisture with them and the winds that blow down the river from the Andes are cold and when they come together, the moisture condenses and it rains.

The scenery looked about the same all the way along—just one mass of tropical trees of all kinds for the warp and these were woven together with vines of every description for the woof. I could see our finish before we started

in to "look over the ground" as Bert had suggested when we were in dear old New York. Yes, dear little old New York—how I wished I were back there again.

As for rubber plantations they were there, the savage tribes of Indians were there too—I didn't see them on the trip up stream but they were there all right just as Bert had said. There were no tigers as Bert guessed but we saw the onca, or jaguar (pronounced *ja-gwar*), a buff feline beast covered with black spots that is a second cousin to the tiger in both size and ferociousness.

The whole blooming tribe of monkeys with faces on them that ought to make a fellow ashamed to look at himself in a glass, and make you know that Darwin was right; boa-constrictors and seven million, more or less of other kinds of snakes were there—in fact equatorial America was all that Bert, or I, or any one else, ever dreamed it was and then multiply it by about a hundred and you will get a faint impression of it. Yes, beasts, birds, fishes, snakes and insects end without number, and each a marvel of its kind, were there and so was the Indian princess.

There was the *tapir*, a sort of a cross between a horse and a rhinoceros having a short proboscis as though its snout was made of rubber and some one had stretched it for him; it is a shy and harmless beastie that moves about chiefly at night. The *sloth*, a greenish-brown animal whose chief business it is to hang back downward from the branch of a tree and to sleep away its life.

The *ant-eater* who picks up a living by eating ants and other insects. All hail to the ant-eater! I've seen a dozen other animals down there that have no business outside of a jungle, or a zoo or a menagerie. Lizards are there in great variety from those that change their colors while you wait to those the natives serve up for you to eat.

And talking about colors, no coal tar dye was ever discovered that could begin to equal the plumage of the birds down there. Large parrots called *macaws*, parakeets, which are little parrots with long tails, cockatoos and love birds, which belong to the parrot family, and others on down to humming birds that are scarcely larger than wasps, are as thick as microbes in sour milk.

But the jungle is the paradise of the insects; there is every conceivable kind and then as many more that are beyond human belief: gigantic, gorgeous butterflies, beetles that looked as if they had been stencilled with the rainbow colors of the sun, and flies as numerous per square unit of space as grains of powder in the charge of an 8 gauge shell.

The ants, though, have all the other insects *faded* and everything else in the jungle that lives on the ground. Next to William Hohenzollern's armies that devastated Belgium and Flanders rank the Amazon armies of ants that march out to seek what and whom they can devour. Everything from a jaguar on down that gets in their way becomes meat and drink for them.

You have, of course, often watched our little fireflies and wondered what kind of an apparatus was installed in their anatomy which produces the intermittent, phosphorescent light as they flit around. Well, down in Brazil there are fireflies that look like electric lights. They measure nearly 4 inches long, and $1\frac{1}{4}$ inches wide and carry three light reservoirs—two in

the thorax and one in the abdomen—and these give off a bright greenish light.

When the natives want a light they simply catch a few fireflies, put them in a bottle and cork it up. They could read by this light if they could read but they can't so the chief use to which they put the fire-fly lights is to hunt around in their beds to see what has crawled in with them. This, then, is the cheapest form of light and, according to Sir Oliver Lodge, if man could produce an electric light with as little expenditure of power as the fire-fly then a boy turning the handle of an electric machine could light up a good sized factory.

The things that live in the Amazon River are just as plentiful as those that inhabit the jungle. The *manatee*, or *sea-cow* as it is called, is the largest having a length of something like 10 feet. If you were far enough away from it you might mistake it for a seal for it has the same general outline. Turtles grow to be 3 feet long, and *oddsfish*, there's enough different kinds to stock the seven seas and then have some left over for the boarding houses.

I could talk to you for a week about the

strange living creatures I saw in and along the banks of the Amazon and in the jungle, but the trees and plants are just as wonderful. For instance, there are palms out of which palm-leaf fans are made and palm trees that grow up as high as wireless masts and on their *main trucks* and *pennants* are cocoanuts. Trees that when you tap 'em rubber, milk or cold water comes forth depending on the kind of a tree it happens to be. Also a large number of most uncommon fruits are there in great abundance.

At last we arrived at our destination, Jurutty, a village about 500 miles east of Manaus. When we landed my first and only thought was of home and mother. My trip to the Arctic was a delightful little pleasure jaunt as against this one up the Amazon River! Had I been castaway on the moon, aye, even on Mars, I couldn't have felt more remote from my native land than when I stepped ashore at Jurutty. And yet, would you believe it, now that it is in the past tense I would like to go there once again.

We were met at the dock by Señor Castro, the *fezendero*, that is the owner of the *fezenda*, which means the plantation. He was a mixture

of Portuguese and Indian but none the less a gentleman for that. A motley crew of negroes, men, women and children with very little clothing on and Indians who hadn't the remotest idea why any one should wear clothes at all, and mixtures of these races, were also at hand to see the newcomers.

Señor Castro was right glad to see us and after shaking hands with us half-a-dozen times he led the way back through a path in the jungle to his *fezenda*. We dined in his home as I had never dined before nor have since, drank coffee that threw the surpassing beverage of the same name which is brewed in Child's and the Waldorf-Astoria in the shade and smoked his long tobacco wrapped cigarettes.

Then we talked wireless. The apparatus, as Señor Benoit had said, was there and Señor Castro assured us that we should have all the help we needed to set it up. He told us that there was an electric generator and a crude-oil engine to furnish the power to run it with—and yet there were hundreds of thousands of horse power to be had from the Amazon—but which had never been tapped. Fortunately I happened to know all about the history, theory

and practise of oil engines and how to sell them if the alleged prospects had the slightest idea of buying such power units.

Señor Castro also had a billiard table, a phonograph and other civilized inventions to while away life as pleasantly as possible in the jungle, and taking it all in all Bert and I considered that things were not altogether against us.

After we turned in our bobbinet curtained beds that night all went well until we were awakened in the small hours by the sound of a woman's voice outside. Thinking it was some female in distress Bert awakened the *fezendero* only to be told with great courtesy that it was not a woman but an *organ bird*. Bert returned saying something about forming a *Society for the Prevention of Jungle Noises at Night*, and we slept again.

In the morning Señor Castro took us out to show us his *fezenda*. Three small horses were saddled ready for us to ride—though I can ride a wave at sea much better than I can ride a quadruped on land. We rode around his rubber plantation and Señor Castro showed us how the rubber trees are tapped, explained that the

fluid which comes from the trees is not the sap of the wood but of the bark and we saw how the natives stick little tin-cups to the trees with bits of clay to catch the fluid.

On returning we rode along the edge of the jungle and Señor Castro cautioned us "never to go into the jungle for you will either get lost, be killed by jaguars, bitten by snakes, or by fever laden insects which are just as bad."

"To the south of us," he went on calmly, "are the *Caripunas*—aboriginal Indians that kill and eat people if they get a chance."

"Cannibals?" I asked to make sure I had heard aright, and when he said "yes" I could feel an electric oscillation run up and down my spinal column.

"How far away from here are they?" questioned Bert with a peculiar light in his eyes I had noticed whenever he spoke of adventure.

"The village is about 200 kilometers from here," Señor Castro replied. "It's strange but they seem to have some kind of a sixth sense by which they can tell the moment strangers arrive—some kind of a wireless telegraph system, I guess," and he laughed.

Then he went on: "I don't doubt but that

they have been stalking us because you fellows are new to the place. It's seldom that any of them ever come across this road because I've put bullets into a couple of them and they won't get away with any more of my rubber men on this side of the line."

I asked him if they had captured many of his men.

"Every time my men tread the jungle outside of the *fezenda* they are taken unless they have an Indian guide with them."

"Oh, I see, they are Union savages," said Bert and he added, "I know I'm going to like this place, Señor Castro."

In the days that followed we got right down to business for we wanted that million *reis* as soon as we could get it. We unpacked the materials for the aerial first and every move we made was watched with great interest by the villagers. The *phosphor-bronze* wire for the aerial seemed to have an especial attraction for them, for they would pick it up, look critically at it and examine it as carefully as though they were looking for flaws in it.

There were two palm trees at least 100 feet high and about 250 feet apart, and Bert and I

decided to use these for the masts. When we had the aerial assembled with the leading-in wire soldered to it I asked if any one there could climb the palm tree and every man, woman and child said that they could. I gave one of the half-breeds a coil of quarter-inch hemp rope to hoist the aerial with and showed him how I wanted the end of the aerial made fast to the tree top and then told him to go aloft.

I wish you could have seen that fellow climb the tree! I used to think our old time sailors were about as clever as they made 'em when it comes to climbing but there's no use talking they're too civilized—too far removed from the monkey family to know how to climb anything but a rope ladder.

The half-breed grasped the back of the tree with the open palms of his hands and placing the bare soles of his feet in front like a jack-knife he just naturally *walked* up it. These same fellows can travel for miles through the jungle by swinging themselves from vine to vine and going as fast as you or I can walk. So you see there are some things an ignorant Amazonian can do that an educated New Yorker

can't do. And thus does Nature's law of compensation work out.

After we got the aerial swung between the palms we set the engine and dynamo in place on their foundations and with some tinkering we got them to running pretty smoothly. To Señor Castro's delight we had enough current not only to work the wireless set but for lighting up his house as well. Last of all came the transmitter and receiver and although these were of French make we had no difficulty in either installing or operating them and it was a *cinch* to get either Manaos on the west or Almeirir on the east.

It seemed that the operators at both stations could get us a deal better than we could get them though all of the transmitters were fitted with one kilowatt transformers. But never mind, we had established communication, thus fulfilling our part of the agreement, and Señor Castro, by all the arts of a true gentleman, showed us how deeply he appreciated our work. Nothing was too good for us. The only flaw in the whole system was the operator at Manaos. He was like the sloth in that he was just as liable to go to sleep as he was to stay awake.

I believe that every message I ever sent had something in it about rubber, whether the body of it related to the doctor, medicines, or what not, for along the Amazon River they live and die by that commodity.

After we had been at Jurutty a few weeks Bert and I got so we knew the *fezenda* about as well as its owner did and we walked or rode about the place either alone or with Señor Castro for we made it a point for one or the other to be on duty all the time and so make a reputation for ourselves and for future United States operators who might happen that way.

I often thought, in my rambles, that I could *feel* the presence of some human being back of a tree, or see a human shadow come and go before I could really make it out, but as this happened very often I came to believe it was merely a case of *nerves*. I talked with Bert about it and he said he frequently heard and saw things too but that there was nothing more to it than a snake or an animal moving about.

“Señor Castro,” he said, “has told us this little yarn about cannibals so that we would keep inside the *fezenda*. There used to be tribes of cannibals in the interior but all that

sort of thing has been wiped out by the Jesuit missionaries long ago."

I was out for a walk one morning not long after and I heard a monkey crying as though he was in great pain. I located him a dozen or twenty paces in the jungle and went after him. He seemed to have gotten tangled up in some vines and the harder he tried to get away the tighter they held him.

Just as I reached up and released him a piece of wood was slipped into my mouth by some one from behind making it impossible for me to utter a sound and before I could take my revolver from its holster my hands were pinioned back of me and my feet were bound so that I couldn't kick, much less run. Although I kept my eyes open I couldn't see a man-jack of my captors nor did they make the slightest noise.

They lifted me up bodily and after a few manœuvres in penetrating the jungle we finally reached a pretty well trodden trail and then they set me down and took the gag out of my mouth. Four strapping big, copper colored bucks with splashes of red paint on their stark naked bodies were the imps of Satan who had so unceremoniously abducted me. I would

have given just \$7.00 in American gold to have gotten each one of them to hold on to the spark-gap of a 10-inch induction coil for just one second.

They were a quartet of jim-dandies and all they needed was a stove-pipe hat apiece to complete their outfits.

Again they boosted me into the air and with a savage at each corner of me they started off on a dog-trot, whither I knew not but what I did know was that I was a goner. After a march, or a trot, of two days and nights we came to an Indian village. There were several hundred men, women and children savages about but they were dressed better than the hunters who had brought me in for each one wore a string around his or her waist and a rattle-box on her or his ankle.

If any one thinks that cannibalism has been wiped out in the Amazon jungles he has another think coming for I saw with these—my own eyes—the whole horrible ceremony gone through with of eating human flesh.

After I had been there a few days a couple of savages, one with brown hair and beard and the other with red hair and beard, began talking

to me in Spanish after trying Portuguese on me. I was quite surprised when they told me they were rubber men from Señor Castro's *fezenda* whom the cannibals had captured nearly a year before.

We planned escape by the hour, though one of them said that was just what these man eaters wanted us to do and that when a fellow tried to escape they would recapture him, bring him back, put him in the proverbial pot and let him stew in his own juice. We were of a mind that it would be better to be live men turned savages than to be cooked men eaten by cannibals.

His most high worshipful King Oopla relieved me of my revolver, and came nearly shooting up the village,—which I heartily wished he had done,—also my watch, knife, compass and other trinkets which four former articles he generously kept for himself and the latter he gave to a wench whom I afterwards learned was his daughter, the Princess Jaci—which is as near as I could come to pronouncing her name. I called her *Princess Mabel*, the latter name being that of a *shine kitchen-mechanic* we once had.

Her face was thin and small and was topped by an enormous mass of frizzled hair while her eyes set at a slight angle so that you couldn't just tell whether she was looking at you to the leeward or a rubber tree to the windward.

Although her eyes were thus slightly out of alignment and her mouth was cut on much too large a scale, which gave her a hard look, she was always smiling good naturedly.

The first thing I knew Princess Mabel began to hang around me and to eat and drink out of my cocoa-nut shell. She was an artistic creation in olive drab, small, and lithe, but withal a very amiable and charming maiden as cannibal maidens go.

She hadn't been spoiled by working in high-toned families in Montclair yet. I fought shy of her for some time for I thought they wanted to put up a job on me and that the moment I gave her a pleasant look I'd be on my way to the stew pot; this belief was further fixed in my mind by occasionally finding a skull, a rib, ulna, fibula, and other parts of the human skeleton lying around loose.

The rubber men, who could speak the Indian tongue a little, assured me, however, that the

King had taken a great fancy to me—I suppose because I looked so young and tender—and that the Princess herself thought very well of me. The King's idea, they informed me, was to have me marry the princess so as to improve the royal strain just as his own savage self had been improved in the slave days of South America when the niggers would run away from their masters and seek decent society among the cannibals.

“For heaven's sake, boy,” one of the rubber men said to me, “make up your mind to marry her or we'll all be served up *a la chop suey* in the grill room.”

Henceforth I treated her with all the courtesy and dignity I could command and she reciprocated by showing me where her papa kept my pistol, my watch and my compass—things I was glad to know, and she gave me these stones too, which I am told by dealers in gems in Maiden Lane to be diamonds. How much are they worth? No one knows until I have them cut.

Everything went fine for the next couple of months but I was getting pretty sick of the life and kept scheming to get away. This tribe of savages used powerful bows and arrows barbed

with bone and tipped with feathers. It was all I could do to bend them but the King had one made for me that was more to my strength and I learned to use it with precision and great effect.

Every day I would go hunting and I always had the company of a couple of pleasant secret service savages. Whatever I bagged I gave King Oopla and Princess Mabel the very choicest of it and I always tried to get game that was to their liking. We became great friends and I wouldn't leave these good simple minded people—no not for anything in the world unless I got a good chance.

But I went a little farther every day and often lost myself from my savage guides, but, never fear, I always came back like a dutiful prospective son-in-law should. On returning one day from a hunting trip that had lasted longer than any of the others I had ever made, I found they had killed one of the rubber men and were cooking him *en casserole*.

That evening at sundown the ceremonies began and when it had grown dark great bonfires were lit and the cannibals, with hideous painted faces and bodies were dancing as if

their very lives depended on it to the bombastic beating of tom-toms. Old King Oopla had on his dress suit which consisted of a pair of long horns projecting from either side of his head, a red undershirt, and a celluloid cuff on each ankle. Her royal highness, Princess Mabel, was bedecked out in a wonderful head-gear and a fluffy ballet skirt built up of macaw and other brilliant feathers. A few strings of human teeth around her neck completed her bridal costume. She looked *awful* nice.

The King, Mabel, and myself were squatting on a kind of throne built up in the center of the ring of dancers but so enthusiastic did these royal personages become that the King and the Princess must needs have a fling at it too.

After keeping the dance going into the small hours of the morning they stopped and gorged themselves with human flesh until they fell down in their tracks, actually drunk with the gruesome orgy. It was a preliminary feast to my marriage with Princess Mabel. When at last the coast was clear I recovered not only my revolver but another one from the hole in the tree where the King hid his treasures and giving it to Señor Paes, the surviving rubber

man, we stole forth determined on gaining our freedom or else going to our deaths.

At the end of every mile we covered I put my ear to the ground and *listened in*, but there were no sounds of our being followed. After ten hours' travel over trails that I knew I figured that we were nearer Jurutty than to the cannibal village. We kept right on and after another five hours my ground telegraph told me that human footsteps were coming and I knew it was a question of only a little time until the savages would overtake us.

When they were within arrow shot of us we each stood back of a tree on either side of the trail and as a squad of them came up unsuspectingly we blazed away at them with our revolvers and there were eight cannibal carcasses ready for the buzzards to pick.

When we reached the *fezenda* Bert came near to giving the buzzards still more pickings, for he mistook my companion and myself, with our long, unkempt hair and bare bodies, as brown as those of Indians, for a precious pair of cannibals and he took a couple of pot-shots at us.

After we had taken our baths and put on

some honest-to-goodness clothes we had a long talk-fest. Señor Castro, he said, believed that I had been devoured by jaguars, but he had somehow felt that I had been captured by the cannibals. He had searched into the depths of the jungle for some trace of me until he was taken down with the fever where he lay nigh unto death for a month. When he got well he concluded he'd go north for in the meantime Señor Castro had gotten another operator.

"I'm certainly an unlucky dog, Jack," Bert bemoaned his fate; "I can't understand why I couldn't have had even a look-in on that cannibal business. Here I've been down with the fever while you've had as fine an adventure as ever befell a man. Back to Broadway for mine where the only cannibal princesses I shall ever see are those that trip the light fantastic in the chorus."

"Truly, I'm sorry, old man," I consoled him, "but it wasn't my fault though it was your misfortune. You'll get yours yet, so cheer up."

A week later we were ready to sail down the Amazon to Para, there to take ship for New York. Señor Castro paid us the full amount agreed upon by the manager of the *Compagnie*

Francaise de Telegraphie sans Fil and we had in all a total of about 4,000,000 *reis* between us—in fact we were, as we had anticipated, bloated millionaires. I had a satchel full of bills of big denomination—there is neither gold nor silver money down there.

When we got to Para, though, and we began to spend our money we were astonished and disgusted to find that a meal cost about 6000 *reis*, the street-car fare was 400 *reis* and the postage on a letter home was 300 *reis*. In other words, a 1,000,000 *reis* was just about equivalent to 325 dollars in our money. Well, we were millionaires while we thought we were anyhow.

What about the diamonds I have? I don't know but if they are the real thing I think I'll organize a company, go down there with a machine gun, wipe out the cannibals and open up a diamond field.

CHAPTER VI

WORKING WITH MARCONI

I MUST tell you about a fine experience I had with Mr. Marconi when he received the first signals across the Atlantic, but before I do so I want to say a few words concerning the great inventor and his wireless telegraph.

Quite a number of people seem to be imbued with the idea that no one ever thought of sending messages by wireless before Mr. Marconi—in fact that he just put together a few old electrical instruments and forthwith sent and received messages over space without any connecting wires.

Of course the basis for these erroneous impressions is that Mr. Marconi is said to be, and rightly, the inventor of the wireless telegraph. Now I want to put those young fellows who are reading this account straight on the matter. Many men may work on a device and none of them hit upon the thing that is needed to make

it practical; then some fine day a genius will happen along and see just what the device lacks and add it to the general collection, or he will put something to it, perhaps accidentally, that does the business, and this last touch which enables it to be used gives the man who does it the right to be called its inventor.

Now, dozens of men, including Morse, Edison and Tesla in this country, and Hughes, Pierce and Lodge in England, worked on the scheme of sending messages without wires; but they either experimented along the wrong line, or the few who worked on the right line did not push far enough ahead to get anywhere. The result was that by the time Mr. Marconi tackled it all the instruments that were needed for telegraphing without wires were at hand but no one had quite caught on how to use them.

Nearly every one thinks, too, that it is far more wonderful to send wireless messages than it is to send messages over a wire; but this is not the case at all, though both, I trow, are wonderful enough. When we say a message is sent by wireless we do not mean, by a long shot, that it goes from the place where it is sent to the place where it is received without anything

between them to carry it. Nor again do we mean that it goes to a single receiver and nowhere else.

For instance, when you talk to a person ordinarily you convey to him your message without wires, but it is the air between your mouth and his ear that carries the message, that is, waves are set up in the air and these are called *sound waves*. Naturally since the air is everywhere on the surface of the earth the sounds you make travel in every direction.

A better example of wireless is a lighted lamp and your eye, for in this case the lighted lamp acts as a transmitter and sets up very short waves in the *ether*, which are called *light waves* and these likewise travel in every direction. The ether is a substance that is 15 trillion times lighter than the air and it fills the whole universe, and when the electric waves set up by a light in it strike your eye the optic nerve carries the sensation of them to your brain and you see the light.

The next thing to know is that light waves and wireless waves are exactly the same kind of waves, that is, both are caused by electric stresses and magnetic whirls in the ether, but

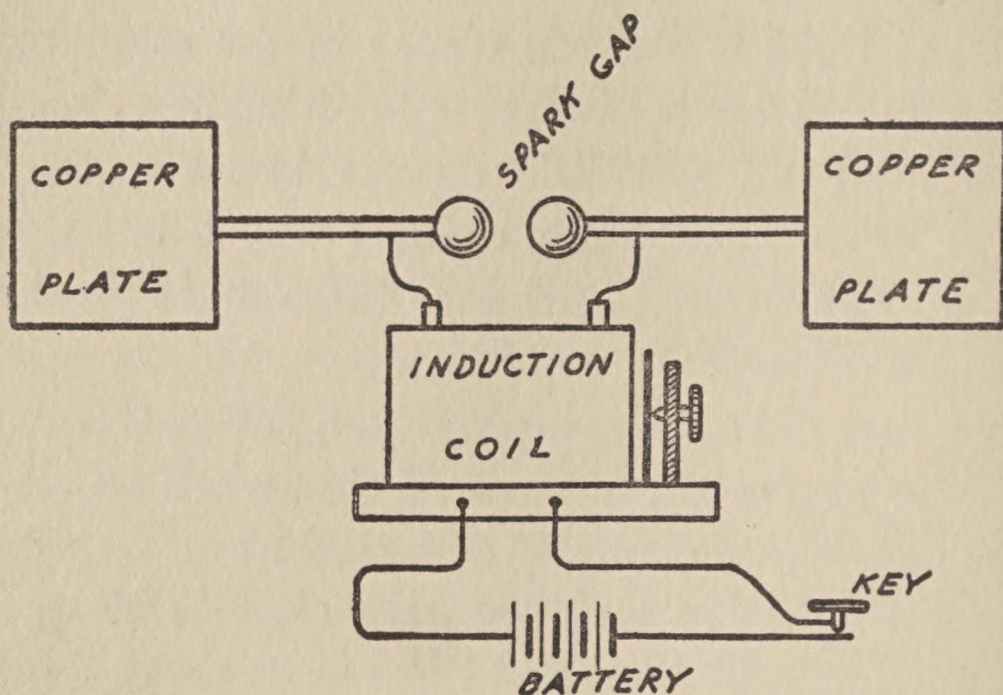
while light waves are in the neighborhood of the ten-millionth of an inch in length, wireless waves are so long they make no impression at all on the eye.

That light is electric waves in the ether has been known for the last couple of hundred years and later on scientific sharks believed there were other and longer electric waves but they didn't know how to produce them or to receive them until 1888.

In that year Heinrich Hertz, a young German college professor, discovered that when an electric spark was made by any kind of an apparatus the positive and negative electric charges in uniting together would not only break down the air to make the spark, but would form an *oscillating current*, that is, a current which surges to and fro hundreds of thousands of times a second, and that this *high frequency current*, as it is called, sets up waves in the ether just as the vibrations of a bell set up waves in the air.

Hertz made an apparatus by which he could produce electric waves of different lengths and this he called an *oscillator*. It consisted of a couple of wires fixed to the balls of the spark-

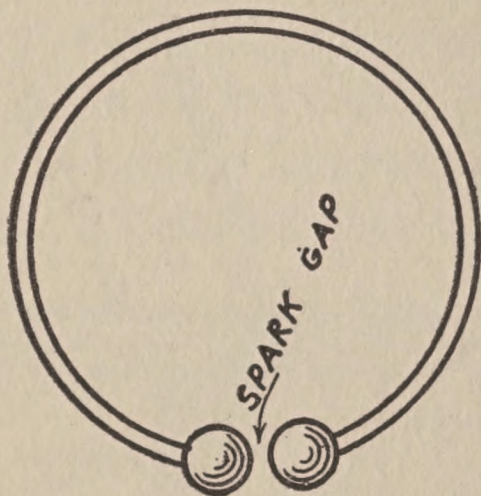
gap of an induction coil, on the other and free end of which were soldered a couple of sheets of copper. (See the accompanying picture.)



He also devised a simple apparatus to detect the presence of these waves—that is, to receive them, which he called a *resonator*, and this was a cut wire ring with a little brass ball on each of its ends as shown in the following diagram. Now when Hertz set his induction coil going, streams of sparks were set up in the spark-gap of the oscillator and *electric oscillations*, or high-frequency currents, surged from one of the copper plates to the other and back again, and

these sent out trains of electric waves through the ether.

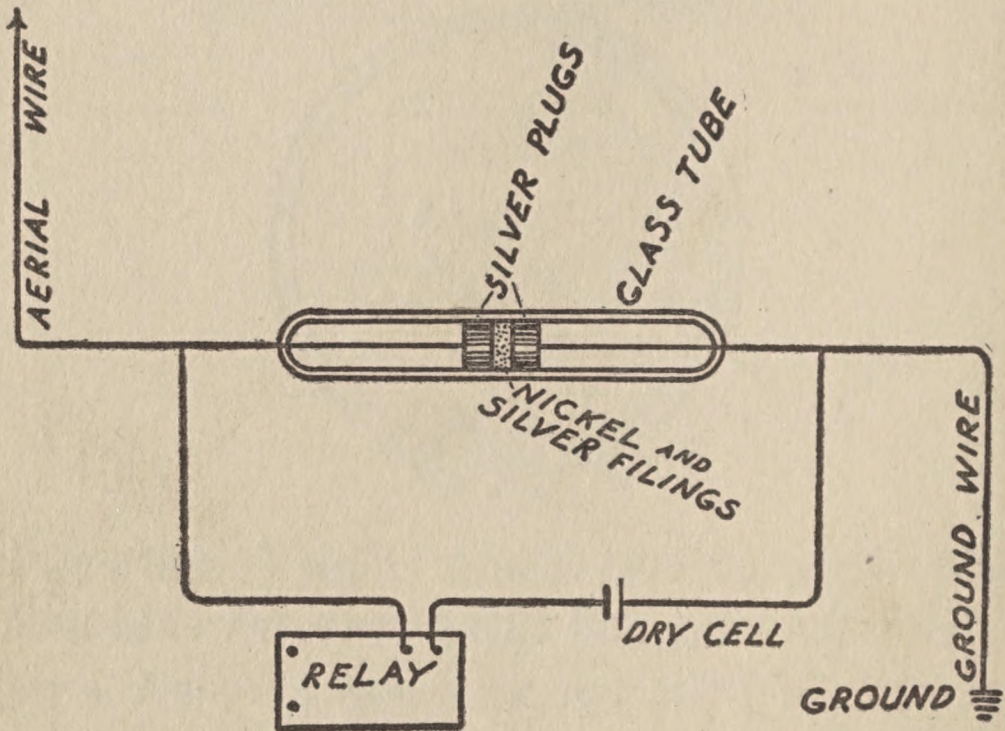
By holding his resonator, or as we would call it now, his *detector*, at a little distance from his sending apparatus, when the latter sent out the electric waves they would set up electric



oscillations, or currents of high frequency, in the ring detector and these in turn would make a stream of little sparks jump across the gap between the balls.

Here, then, was a complete wireless sending and receiving apparatus, but it would work only a short distance, probably not over 100 feet. But Hertz was not trying to invent a wireless telegraph; all he wanted to and did do was to prove that there were long electric waves and there his work ended.

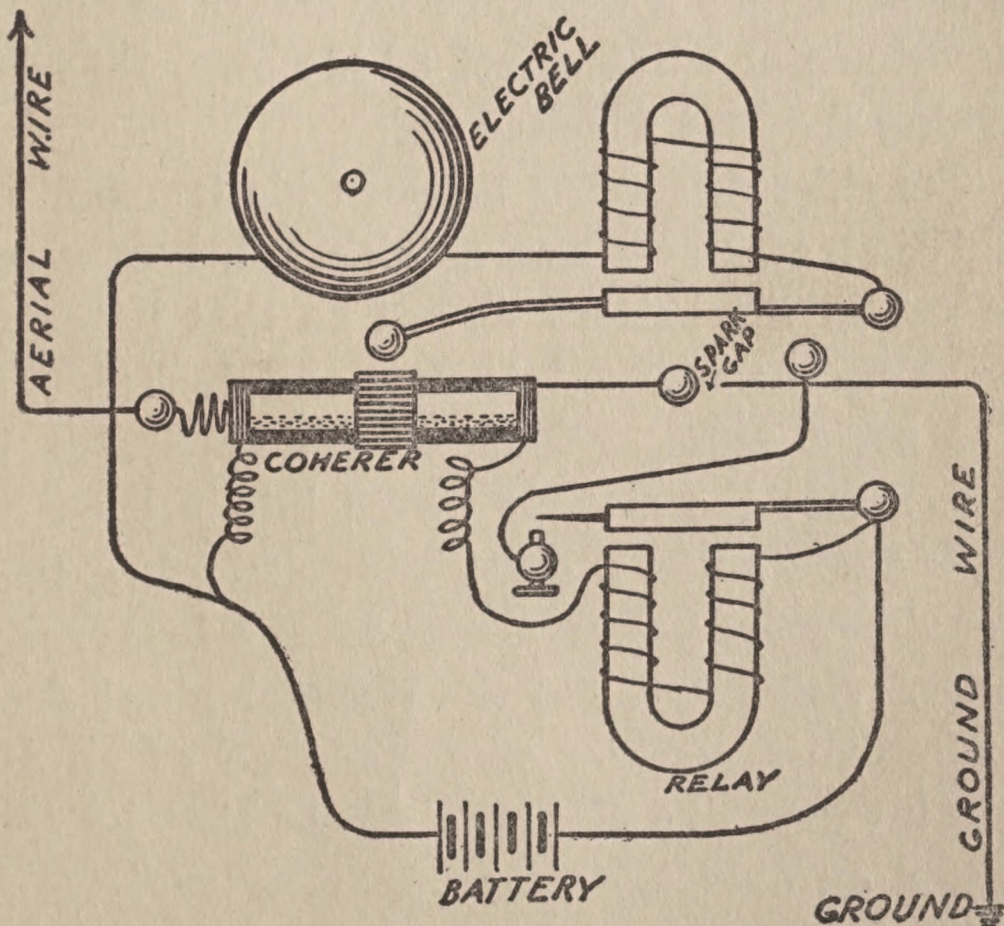
After Hertz had shown how long electric waves could be set up by the sparks of an induction coil, other scientific chaps went to work to get up a better scheme to detect them. In 1890 Edouard Branly, of France, discovered that when metal filings were put in a tube and



electric waves were allowed to fall on them the resistance of the filings was lowered, and Sir Oliver Lodge, in 1894, found that this was caused by the filings being drawn closer together, that is, they *cohered*. By connecting a *coherer* (see the diagram) as he called the filings detector, to a galvanometer and a dry-all

he was able to detect the presence of electric waves up to distances of 500 feet.

A year later Popoff, of Russia, made a receiver for studying electric storms—lightning is only gigantic electric sparks—and this consisted of a coherer, a battery, a relay and an electric bell. Popoff connected one side of the coherer with a wire which he ran up into the air, or *aerial wire* as we call it now, and the other side of the coherer he grounded, as shown in the diagram. This was the first time that



an aerial wire and a ground had ever been used in connection with a coherer. With this apparatus Popoff was able to hear the coming of storms for hours before they appeared above the horizon.

About this time Guglielmo Marconi, who was only 20 years old, was going to the University at Bologna, Italy. Prof. Righi who lectured on physics there was repeating Hertz's experiments and used Branly's coherer for detecting the electric waves. This set Marconi to thinking and it was not long before he had an experimental wireless set of his own, thus becoming the first wireless *kid*.

The chief difference between his transmitter and that of Hertz was a telegraph key which he put in the battery circuit so that he could break up the sparks into dots and dashes. He also set a reflector back of the apparatus to concentrate the electric waves into a beam to make them go in a given direction when they would be more powerful and cover a longer distance. But Hertz did the reflector stunt first.

Marconi's receiver was made up of an apparatus just like Popoff's except that he connected an old-time Morse printing register in

the battery circuit so that when the electric waves acted on the coherer the signals would be printed on a tape in dots and dashes.

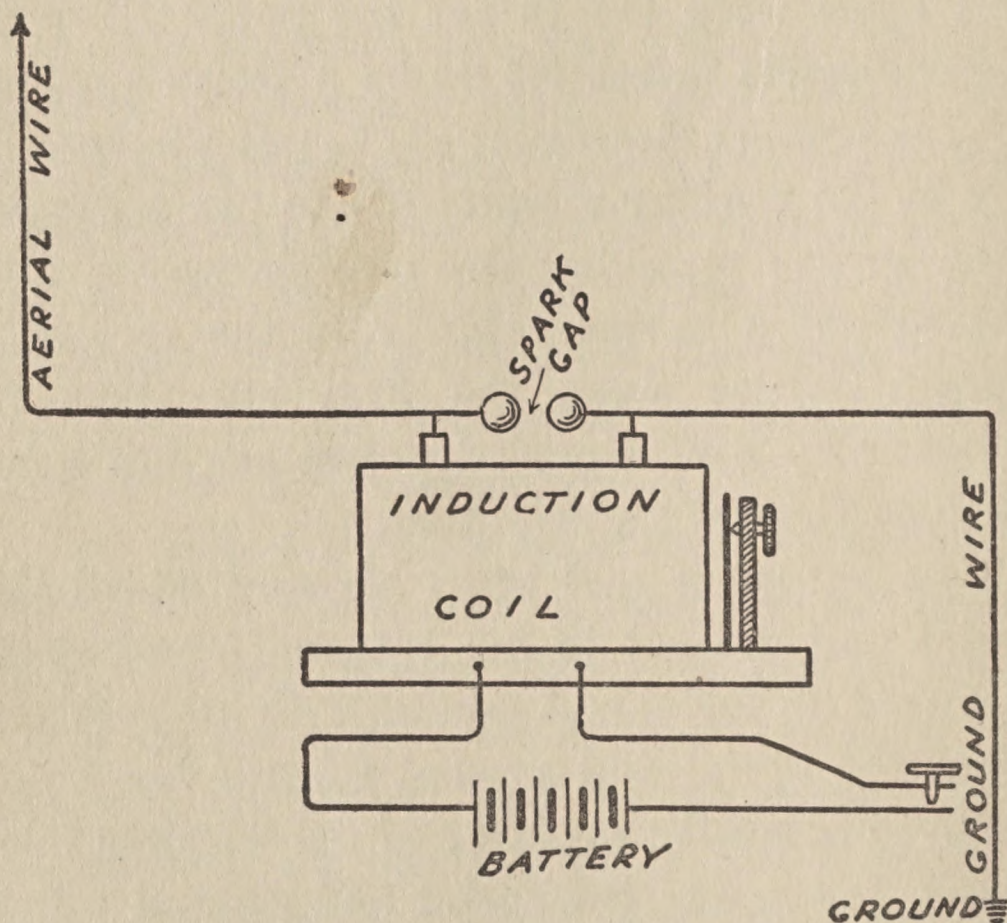
In his first attempts, then, to send wireless messages, young Marconi had done four things and these were (1) to see the possibilities of using electric waves set up by a Hertz apparatus for sending messages; (2) to put a telegraph key in the sending circuit; (3) to use a Popoff receiver for receiving the electric waves, and (4) to put a Morse register in the receiving circuit. These were the first big steps in building up a wireless telegraph set, but none of them formed an invention.

I do not know just when Marconi added the aerial and ground to his transmitter—Popoff had used an aerial and ground with his receiver—but the aerial and ground formed his great claim to being the inventor of the wireless telegraph, for it was the aerial and ground which enabled him to cover long distances.

In 1896 Marconi went to England and there applied for a patent in which he showed an aerial and ground connected to his sending and receiving apparatus (see the diagram) but even at this time he did not understand the impor-

tance of a high, well insulated aerial and a good ground.

On arriving in London this boy, with the big idea in the back of his head and a lot of business ability in front of it, went to Sir William Pierce



who was then at the head of the British Post Office and offered to give him a demonstration of his new wireless telegraph. As Sir William had long been interested in the possibility of wireless telegraphy he was agreeable. The

outcome of it was that one station was rigged up in the General Post Office and another on the Thames embankment about 300 feet away.

These experiments were successful enough to interest the War Office and he was asked to show what he could do over longer distances. Salisbury Plain was chosen for the trials and by placing reflectors back of the sending and receiving apparatus he was able to telegraph over a distance of about 2 miles.

Marconi now commenced to experiment with aerials and grounds in order to increase the effective range of his apparatus and with them he was able to cover the distance of 3 miles between Lowernock and Flat Holm. Sometimes in these trials the dots and dashes would be printed good and clear and at others they were all jumbled up.

The inventor was trying all sorts of schemes to get satisfactory results, but nothing helped until he heightened the aerial wire on his sending apparatus. Presto! the signals came in clear and without a miss. Here then was the whole secret of wireless telegraphy—the higher the aerial the farther messages could be sent with the same amount of power.

This was the real beginning of wireless telegraphy and from that moment on Marconi's star began to rise. It was not long before he was telegraphing over a space of eight miles, the aerials at both ends being held up in the air by kites.

These astounding results had reached the ears of German scientists and through the *pull* of the former German Emperor, now plain Mr. Hohenzollern, things were fixed so that Dr. Adolph Slaby, of the Charlottenburg University, was allowed to be present while Marconi was sending and receiving messages.

The learned doctor deliberately *swiped* Marconi's ideas and on returning to the land of *kultur* he bent his energies toward outdoing and undoing the young inventor who showed him how to telegraph without wires. Of course, Dr. Slaby invented a system of wireless telegraphy and this was quickly used on the ships of what was formerly the German Navy.

But Marconi's fame as the real inventor of the wireless telegraph had too sound a bottom for his detractors to hurt him much and he went right on about his work without the slightest caring whatever. He was next invited by the

King of Italy to visit his native land and to make some experiments there. A shore station had been put up at Spezia and a couple of war ships were fitted with wireless equipments. In the tests which followed Marconi broke the record for wireless and his achievement was the talk of the world.

Wireless, like its inventor, was on the upgrade and in England *Marconi's Wireless Telegraphy Company, Limited*, as it was at first called, was organized for the purpose of installing his system on ship and shore stations. Stations at Bournemouth and at Alum Bay on the Isle of Wight, about 14 miles apart were put up and Marconi did a great deal of experimenting and increased his range to 18 miles when he sent to and received messages from an out-bound steamer.

No one could shut his eyes to the value of wireless at sea and *Lloyd's*, the great shipping corporation, had two stations put up at Ballycastle and Rathlin Island on the northern coast of Ireland where experiments were conducted to further test the reliability of the system in all weathers.

The *Kingston Regatta* was the next event

in which wireless figured and the *Daily Express* of Dublin arranged with Marconi, or his company, to install his apparatus on a ship and report the races to the shore station for the benefit of their readers; and this was done without a hitch. Talk about a *scoop*! Here was a *wireless scoop*. Can you beat it!

About this time the Prince of Wales, afterward King Edward VII, met with an accident and he went aboard the royal yacht *Osborne* to recuperate. Could Marconi fit up a station on it and also in the royal residence *Osborne* where Queen Victoria was staying so that communication might be kept up between them? Of course he could and he did it with much satisfaction and pleasure to his royal patrons and credit to himself.

The next installations of note were made by the *Marconi Company* at South Foreland Lighthouse and East Goodwin Lightship which lay off the Goodwin Shoals about a dozen miles away. This was in December, 1898, and very shortly after a steamer was stranded on the shoals. A *C Q D* signal was instantly flashed from the lightship to the lighthouse and brought help that saved the ship with its cargo

which together were worth a quarter of a million dollars.

Bigger things were now in order and greater distances were to be spanned. Early in 1899 Marconi set up a station at Dover on the English coast and another at Wimereaux on the French coast. The distance between these stations was 30 miles but Marconi had no trouble in sending messages forth and back across the English Channel.

This astounding feat made the *British Admiralty* sit up and scan the horizon and seeing wireless writ large upon it, it had Marconi put his outfits on three cruisers that very year. During the naval manœuvres which soon took place wireless as a factor in fighting was given a thorough tryout with the result that the top-notch distance was reached when the flagship of the fleet signaled orders to one of the cruisers at a distance of 85 miles.

I remember distinctly how every one over here was talking about that wonderful wireless and the boy who invented it. Consequently when the *New York Herald* announced that it had engaged Marconi to report the *International Yacht Race* at New York, the one word

on everybody's tongue was *wireless*. A ship fitted with wireless that followed in the wake of the yacht, and a shore station was used as in the *Kingston Regatta*. Over 4,000 words were transmitted from the wireless ship to the shore station where they were retransmitted by wire to the *Herald* office in New York.

The Marconi interests got busy on this side of the *big wet* and organized a company to carry on the business over here. Stations were put up in 1901 at different points on the Atlantic coast and also in England. The *British Marconi Company* entered into an agreement with *Lloyd's* in which the latter agreed to use only the Marconi system for a term of 14 years and that ships fitted with Marconi apparatus should not exchange messages with ships carrying any other make of apparatus. Then began the great business of installing Marconi apparatus on the fleets of transatlantic shipping routes. Still Marconi wasn't satisfied; he wanted to and did do bigger things.

I hadn't been home from South America more than a fortnight when it just so happened that I *listened-in* (without a receiver and quite unintentionally I assure you) to a conversation

between two officials of a certain wireless company. The message I got was that Marconi was on his way to St. Johns, Newfoundland, with a couple of assistants and that his purpose was to find out how far he could receive messages from passing steamers.

My subconscious self immediately wirelessly communicated to my conscious self that it would be a fitting piece of business for me to work under the great inventor—though he was not much older than I. I knew perfectly well that there was no use trying to get a job with him through the ordinary channels for he had brought his own assistants from England with him and, of course, none others were wanted.

Therefore, I said nothing to any one but quietly hopped on a train for St. Johns, and trusted to luck for the rest. Did you ever notice, Mr. Collins, that when you make up your mind to do a certain thing and you try as hard as you can to do it, good luck generally meets you somewhere along the road and gives you a lift?

Well, when I got to St. Johns, it was the 3rd of December, 1901. I went into a second hand store and bought an outfit of clothes so that I

would look like the rest of the working people up there; and when I put them on I flattered myself that I did; my face and hands tanned in the tropics helping out *quite some*.

I learned that Marconi and his assistants had not arrived nor had any one heard that they were to come. I figured it out that their coming was either a secret or a hoax—in fact, I was inclined to the latter belief; and I had great fears I was on a wild-goose chase and that I had spent about half a million of my hard-earned Brazilian *reis* for nothing. I stuck around though, and on the 6th who should come to town but the inventor of the wireless telegraph, though to look at him you would not have suspected it. I did not make known to his assistants that I was an operator but when the boxes and hamper which contained his instruments were unloaded I jumped in and helped to put them on the wagon.

Mr. Marconi—now that I had seen him he was Mr.—and one of his assistants left and the other remained behind to look after the bags and baggage. He thought I was the helper of the driver of the dray and the driver thought I was one of the assistants—or at least

that's what I thought they thought. At any rate when we got the dray loaded I just naturally jumped on and went with them.

Mr. Kemp, the assistant, instructed the driver to go to Signal Hill, which is about half-a-mile from St. Johns and right at the mouth of the harbor. When we got there I was nearly frozen but I buckled right down and helped the drayman to unload the stuff and to carry it into the barracks. When he had been paid and was ready to go I said to the driver, "guess I'll stay and help around," and when he said "all right," I knew that matters were pretty well fixed. From that time on I made myself generally useful as a first class roustabout.

While Mr. Kemp and I were busy unpacking the apparatus, kites and balloons, Mr. Marconi and Mr. Paget came in. The inventor wore a fur cap and a fur trimmed overcoat. He took these off, just like a common everyday man, and stood by for a moment looking on. He didn't say anything and you can bet your last Brazilian *reis* that I kept my mouth shut. Now and then, though, I took a good look at him for he was, indeed, no lesser personage than the

great inventor of the wireless telegraph—Gugliemo Marconi!

He was then 27 years old but he looked at least ten years older. His father was an Italian and his mother was Irish, but Mr. Marconi, except for his bluish eyes and rather light hair, looked strictly like a son of sunny Italy. He had a high forehead, long and rather thin nose, largish ears, a big mouth with a long upper lip which was covered with a straggly mustache, a strong chin and deep-set, serious eyes that seemed to be looking beyond whatever he was looking at.

Certainly he was not an inventor of the old school for he was well groomed and dressed in an up-to-date business suit. One thing sure he was not much of a talker and I soon observed that his great part in the game of wireless was a thinking part.

His assistants set up a little apparatus which consisted of a receiver only with a telephone receiver hooked up to it instead of the usual Morse register. The aerial wire was led outside through a hard rubber insulator in the window where it was fixed to but insulated from a stout pole, set in the ground. To the free end

of this leading in wire the aerial wire proper, when it was held aloft by a kite or a balloon, was to be secured.

As his assistants—Mr. Marconi always addressed them as Mr. Kemp and Mr. Paget—were connecting up the instruments there was small show of emotion though I could feel the high tension they were under and shared it with them. Finally the apparatus was connected up and Mr. Marconi tested out the adjustments.

Next we got out several big, nine-foot, hexagon-shaped kites whose ribs were of bamboo and which were covered with silk soaked in *dope* to make it waterproof. These we put together and then from the wicker hamper we took a couple of small silk balloons and filled them with hydrogen gas from cylindrical steel tanks in which it was compressed.

At last on Tuesday, December 9th, we were all ready to hoist the aerial wire with either a kite or a balloon, but the wind was still high and a small blizzard was on. Mr. Marconi did not think it advisable to try to make any tests then, and if we were disappointed what must he have been. The next day the wind was still blowing

strong but we were all anxious to get to work.

“You may try putting up a kite when you are ready, Mr. Kemp,” Mr. Marconi said.

Mr. Kemp was soon ready and with the help of a couple of natives—I was one of them—he got the kite aloft. We used a stranded copper wire for the kite string and this was also to serve for the aerial, but the moment we had it well up a gust of wind hit the kite, the wire parted and—we were ready to try again.

Mr. Marconi then suggested that we try one of the balloons. We took it outside, fastened the aerial wire to it and, different from the kite, we had no trouble in getting it to go up. No sooner had we let out all the wire than it snapped again and the balloon sailed out to sea.

The next day the wind was just as high but we stuck to the barracks in case it should go down. There were bits of talk among Mr. Marconi and his assistants about the instruments, the ground, the aerial and other things which would have been as Greek to any one but an old operator like myself. I drank in every word that these pioneer wireless men said but never a word said I. Once Mr. Paget asked me to hand him a dry-cell and I handed him a binding

post instead. Some one said "*stupid*" under his breath but still loud enough for me to hear it and I was happy. None of this *wireless kid* stuff here. I was getting away with murder.

Mr. Paget looked at his watch. "Poldhu is sending now. Too bad we haven't a kite up, Mr. Marconi."

"We must get it up. Mr. Kemp, will you be good enough to try again?" Mr. Marconi said.

Oh-ho, said I to myself. I am in on big doings. What Mr. Marconi is here for is not particularly to get signals from passing ships far out at sea, but to try and get Poldhu! It made my hair stand on end at the thought of such wonders. And if he gets it he will have spanned the Atlantic—over 2,000 miles—with his wireless waves. He will have done the biggest scientific thing since Cyrus Field joined the old and the new worlds with his cable! Whoopee! Yow! Yow!

From that moment on I was walking on air. The inventor, whatever he may have felt, was calm, cool and collected, dignified at all times but always in a good humor. The strain he was undergoing must have been tremendous, but he had trained himself well in the art of

restraint and no one, not *in on the know* would have ever suspected it.

At Poldhu, on the Cornish coast of England, the *Marconi Company* had built, for the express purpose of making this greatest of all experiments, the most powerful wireless station that had yet been put up. It had been figured by Marconi and his technical adviser of England, Dr. Fleming, that to transmit wireless messages across the ocean, 15 vertical wires 210 feet high, would have to be used and that these would have to be energized by oscillating currents equal to about 25 horse power. It was indeed a veritable lightning and thunder plant!

On Thursday, the 12th of December, we flew another kite and Mr. Marconi came out and personally saw to it that no flukes were made. The wind was still high and fitful, but with extreme care in which all of us, including Mr. Marconi, took a hand we somehow got it up and held it at about 400 feet.

Then the inventor and Mr. Kemp went into the wireless room. This was about 11:30 o'clock in the morning, St. Johns time. We held the kite as steady as we could and I knew that the supreme time in Marconi's life was at

hand. After waiting half an hour—it seemed like an eternity of time even to me—Mr. Kemp came out of the barracks and hurried over to where we were holding the kite. I couldn't tell from his face whether the experiment had been a success or not, for an Englishman's face always looks the same.

“We got it!” he told Mr. Paget. “Mr. Marconi got the signal first and then handed the head-phone to me. I heard the three dots several times in succession quite clearly.”

The three dots forming the letter *S* were those agreed upon by Mr. Marconi and his operators at the Poldhu station before he left England, as being the best signal to send out.

“Fine, old top,” exclaimed Mr. Paget, or words to that effect.

Mr. Kemp then went back to the barracks and in another half hour he emerged again and told Mr. Paget that the signals were still coming in and that there wasn't the slightest doubt but that they came from Poldhu. He said that Mr. Marconi had asked that the kite be kept up for another hour if possible.

The wind grew more blustery than before, but anything was possible now for nothing so

makes for success as a little success. The aerial was often more nearly horizontal than vertical, but Mr. Marconi got the signals as they were flashed out by Poldhu just the same. This ended our work for the day—that never-to-be-forgotten 12th of December.

The next day we flew the big kite using the aerial wire for a string again, for Poldhu had been instructed to keep on sending the letter *S*. The three short dots were sent out right along with short intervals between them, but the kite would take a header every time it was hit by a gust of wind and this would bring the aerial wire down so low the signals could not be heard, and, again, the receiver had to be kept in close adjustment.

After these last tests we hauled in the kite and then came the soft job of packing up the stuff. While we were doing this I threw a bomb into Mr. Marconi's camp by telling Mr. Paget that I was Jack Heaton, the former chief wireless officer on the *Andalusian*. He told Mr. Kemp and they both smiled.

“Well, bless my heart, old man,” he said with about as much show of emotion as I do now in repeating it to you. “I rather thought, don't

you know, that you were as smart as paint—too smart to be trundling boxes around on a bally goods wagon. Who told you to come up here?”

“No one, Mr. Kemp, I just wanted to work under Mr. Marconi so that I could say I had done so and I came up from New York of my own accord.”

“Well, bless my old soul!” Mr. Kemp continued, which was his way of expressing his opinion of the *nerve* I had shown.

I kept right on packing up the stuff under the direction of the two assistants and after a while when Mr. Marconi came over Mr. Kemp spoke to him.

“I say, Mr. Marconi, this chap is Jack Heaton who was the operator on the *Andalusian* when she went down. He says he came up here to work with you. I don’t know who took him on; I didn’t and Mr. Paget says he didn’t.”

“Mr. Marconi, I’m mighty glad to meet you,” I said and held out my hand.

He grasped it firmly and shook it just once and that was worth another million dollars. What’s that? Well, it was worth a hundred anyhow.

“Extraordinary,” said the great inventor as though this big word had but two syllables in it. “*Quite* extraordinary. I hope, Mr. Heaton, you have not been disappointed.”

“I not only deeply appreciate the fact that I have been one of your assistants, sir, but to have been present when you received the first cableless signals across the Atlantic was an honor I never dreamed of.”

With his usual deliberateness the inventor did not immediately give to the world at large the wonderful results of his transatlantic experiments but waited for two whole days after he had completed his tests. When he did finally make them known there was quite a conflict of opinion, for some believed and others doubted that he had actually received the signals from Poldhu.

Many of those who had followed wireless telegraphy from its beginnings and knew somewhat of the theory of how it worked, set up a hue and a cry that the signals he had received were sent by ships at sea, or else they were due to *static*, as we call it now, that is, little charges of atmospheric electricity which accumulates on the aerial wire and finally discharges through

the detector into the ground and this makes a click in the head-phones that sounds like a dot.

When the equipment was packed up Mr. Kemp paid me off—not at the measly rate of a truck driver or a roustabout in St. Johns, but an amount considerably over that which a first-class operator gets and my expenses for a round-voyage beside. I was soon headed once more for New York.

During the next two months Mr. Marconi's critics were still carping about the cableless signals. And then the inventor put a big one over on them that made them crawl into their holes. In February, 1902, the s. s. *Philadelphia* sailed from England with the inventor on board. The wireless receiver was of the regulation ship and shore type, that is, it had a coherer and a Morse register, and it was nowhere nearly as sensitive as the detector and telephone receivers used in the Poldhu tests.

Mr. Marconi had arranged for the station at Poldhu to send messages every day at certain times until the *Philadelphia* arrived at New York. He adjusted the ship's receiver himself and from the time she left England messages sent from the Poldhu station were printed on

the tape until the ship was 1,551 miles out and from that time on signals were recorded on the tape up to 2,099 miles.

This time there was no possible chance for the doubting Thomases to say that there might have been an error, for there were the records printed in ink on a tape and not only Mr. Marconi but the officers of the ship saw them, and the tape at different times was signed by the Captain. Thus the last one read:

“Received on s. s. *Philadelphia*, Latitude 42, 1 N., Longitude 47, 23 W., distance 2,099 (two thousand and ninety-nine) statute miles from Poldhu. Capt. A. R. Mills.”

This then was the beginning of sending messages across the ocean without wires, or *cableless telegraphy*, as you call it, and I was in on it.

CHAPTER VII

A GOVERNMENT OPERATOR AT ARLINGTON

NEARLY every one has the idea, or mania, or whatever you call it, of making some kind of a collection. It often begins to show itself early in a fellow's life, and I've seen some old codgers in which it was still going strong at seventy.

For instance, when I was only 10 or 12 years old I began to collect postage stamps; mother started to collect trading stamps as soon as they were invented; dad has a wonderful collection of old carbureters, which ill-fated motorists had thrown away, and Messrs. Carnegie and Rockefeller are still collecting the coin of the realm.

The pet collections of the ladies of my home town consisted chiefly of souvenir spoons, china, pewter-ware and cut-glass while the men collected autographs and books, bugs and butterflies, antiques and paintings, fishing tackle and

sporting guns. Then there was a sad-eyed young man whose parents were poor, but dishonest, who got a notion he would make a collection of all the solid silver water pitchers in and adjacent to Montclair, but the police made him to part with his novel collection and for the next five years he had ample time to collect his scattered wits.

A few years after I had been with Mr. Marconi at St. Johns, when he received the first signals flashed across the Atlantic, his and other companies and various governments began to put up and to operate gigantic cableless stations. It came to me that it would be a nice thing to make a collection of all these big wireless plants. In thinking it over, though, I had to admit there were a couple of obstacles in the way which would make it a mighty hard proposition to carry through—and these were: (1) I couldn't get them all in our back-yard in Montclair, and (2) I didn't have the ready money to buy them.

The next best plan, I pictured in my mind's eye, would be to make a two foot scale model of each one of them and arrange them in a double row like the mummies in the Metropoli-

tan Art Museum. As this scheme too, I figured, would take much time and money I compromised the matter by promising myself that I would visit each station in turn as they were put up and then in the end, I'd have a mental collection of them and this, at least, wouldn't take up any room nor would it cost very much.

After Marconi had received messages up to 1,551 miles and signals up to 2,099 miles at sea on a Morse register from his experimental station at Poldhu the future of cableless telegraphy was an assured fact.

In 1902 stations of much greater power were put up at Poldhu, England, and at Glace Bay on the Newfoundland Coast and at Wellfleet, Mass. When the latter station was far enough along so that messages could be sent, Colonel Roosevelt, who was then President of the United States was asked to send King Edward VII the first cableless message across the Atlantic. It read:

“His Majesty Edward VII, London, England. In taking advantage of the wonderful triumph of scientific research and ingenuity which has been achieved in perfecting a system of wireless telegraphy I extend on behalf of the American people most cordial greet-

ings and good wishes to you and all the people of the British Empire. Theodore Roosevelt, Wellfleet, Mass.”

As the new station at Poldhu was not in shape to send back the reply of King Edward it had to be transmitted by cable and it read:

“The President, White House, Washington, America. I thank you most sincerely for the kind message which I have just received from you by transatlantic wireless telegraphy. I sincerely reciprocate in the name of the people of the British Empire the cordial greetings and friendly sentiments expressed by you on behalf of the American nation and I heartily wish you and your country every possible prosperity. Edward R. and I., Sandringham.”

That cableless telegraphy might be done on a commercial basis to the best advantage the *Marconi Company* decided to put up two new and more powerful stations, one at Clifden on the coast of Ireland and a new one at Glace Bay on this side of the Atlantic. When these stations were finished the regular transmission of both private and public messages across the Atlantic began in competition with the cable lines. The exchange of cableless messages was kept up for ten months when the station at

Glace Bay burned down. Work on another station was started at once, however, and new apparatus was built for it.

Again communication was set up between Glace Bay and Clifden, the first messages being sent and received by the Postmasters General of England and Canada.

Now while it was very hard for any one to get a pass to go inside the cableless stations, even the directors of the *Marconi Company* having been denied that privilege, I went up to St. Johns the next summer for a week's vacation and, incidentally, to see the station at Glace Bay. I felt pretty sure I should succeed for I knew one of the operators there.

The station is about three miles from the village of Glace Bay, on the island of Cape Breton; it belongs to Nova Scotia but is separated from it by the Strait of Canso. I didn't have to ask where the station was for four enormously high towers stood out before me like great sentinels, imposing and mysterious and they can be seen for miles around. I could also make out a dozen very high masts.

The entire station is built on rising ground nearly a hundred feet above the level of the

sea and below it lay the waters of big Glace Bay. Three low buildings—at least they looked very low to me as I gaged them with the height of the towers around them—are used for housing the apparatus.

After being halted several times by watchmen picketed on the grounds I finally got to the office and told the man in charge I wanted to see one of the operators, Howard Brice, who, you will remember, was one of my boon wireless chums of Montclair days.

We hadn't seen each other since he and I became professional operators and we had a regular old sea-captain's time of it recounting our experiences.

"Want to see the station, Jack?" he asked.

"Don't mind if I do," I replied in a don't-give-a-care way.

The building we were in not only contained the office but a sound proof room in which the receiving sets were placed. When we crossed the threshold I was standing in a room where even the directors of the company could not tread, not because they were, like angels, afraid, but the men higher up were afraid to let them,

for Marconi had a lot of would-be rivals in those days especially on this side of the Atlantic.

The receivers were of the usual ship type, with magnetic detectors and head-phones, and these were connected to the leading-in wire of the aerial through switches and passed outside through insulators in the wall. Several other wires connected to ordinary telegraph instruments also passed through the wall.

“You see, Jack,” my guide said, “these lines belong to the *Western Union* and the *Canadian Pacific Railway Telegraph Company* and by means of them the transatlantic cableless messages are received for transmission to England or are forwarded to their destination on the Continent.”

This was all interesting enough but there wasn't much to see. We went over to another building which contained the power plant. In here a big steam engine was running an alternating current generator.

“This generator develops 820 kilowatts, or about 1,100 horse-power, and,” he continued, “this is the most powerful generator ever built for a wireless transmitter.”

Again interesting but as far as I could see they looked just like any other power plant. I sized them up just the same to see what I could see.

“Now, let’s take a peep at the sending apparatus,” and with that we strolled over to the third building.

“Sounds like a young thunder factory!” I ejaculated as crashes of electric fire tore through the air like small bolts of lightning.

“If we’d had this station down there in Montclair we’d have had them all by the ears, eh, Jack?”

“I’d say we would,” I returned as I measured with my eye the gigantic high potential apparatus.

This was made up of low frequency transformers, revolving spark-gaps which changed the high pressure alternating currents into high frequency electricity. Then there were the high pressure oscillation transformers, the condensers and switches of large size which were actuated by telegraph sending keys. Yes, indeed, here were the real sights of a cableless station and it was fully worth all that my round voyage cost me to see it. Having feasted

my eyes on this greatest of twentieth century wonders to my heart's content we went outside to get a *close-up* of the aerials.

"You see, Jack, we have two separate and distinct aerial wire systems. The first, which is strung up between the four great towers is used only for sending and the second which is suspended from the sticks is used only for receiving. These latticed towers are built of wood and each one is 410 feet high and together they form a square each side of which is 220 feet across.

"The sending aerial is formed of a large number of nearly parallel wires all of them spread out at the top and coming together at the bottom like an inverted pyramid. This aerial which has 60,000 feet of wire in it was suspended from the tops of the towers. A leading-in wire is secured to the ends of all the aerial wires where they come together at the bottom. It leads, as you see," he pointed to the side of the building, "into the room through insulators where it is connected to the rotary spark-gap through a closed circuit.

"These masts, or sticks, which are arranged in three rows, hold up the receiving aerials.

There are 18,000 feet of wire in it and it is made in the shape of a fan with the handle pointing in the direction of Clifden where our other station is located."

Before leaving Howard told me that when he heard the *Marconi Company* intended to build a pair of cableless stations it was his great ambition to be one of the operators and in getting this position he had realized it. For myself I preferred to go on making my collection of cableless stations rather than to be planted up there at Glace Bay even though this was one of the three places in the world where the overland telegraph lines and transatlantic cableless meet and form a clearing house for the news of two continents.

It was my intention to sail for Belfast, Ireland—all the big steamers touch at that port on their way from New York to Liverpool—and go over to Clifden to see the cableless station there. Before leaving, however, I got it straight from Mr. Bottomley, who was the President of the American *Marconi Company*, that it was built from the same plans as the one at Glace Bay and that the apparatus was exactly the same. I concluded not to bother add-

ing it to my collection but to go to Paris direct and get the Eiffel Tower station instead.

In this choice I was perhaps influenced somewhat by getting a job as second wireless officer on the *Kronprinzessin Cecilie*, a fine fast passenger express steamer of the *North German Lloyd Line*. This German ship—as in fact all other transatlantic liners—was equipped with the Marconi system and this grouched the German officers to the last limits of despair. A little newspaper was published on board every day and, of course, the news in it came *via* wireless. Whenever we had trouble in getting the messages from the stations at Wellfleet, Mass., or Poldhu, England—as was always the case more or less when we were in mid-ocean—the paper which the Germans ran printed them anyway just as we took them down, and then they commented on what a rotten system Marconi's was.

The *Kronprinzessin Cecilie* touched at Plymouth, England, and then sailed across the English channel and touched again at Cherbourg, France, where I threw up the job, as my destination was Paris, and I arrived there a few hours later.

You know the Eiffel Tower was built in the midst of the ornamental park of the Champ de Mars as the biggest attraction of the Paris Exposition in 1885. When it was built wireless was an unknown means of communication and when the Exposition was over there was much talk about wrecking it, for it was not only useless but the Parisians thought it a hideous object to be stuck up in a park.

But when Marconi showed the world how to send messages across the ocean, and since one of the chief factors for long distance wireless transmission was a high aerial, it didn't take half-an-eye for the *French War Department* to see that the Eiffel Tower, which was very nearly a thousand feet high, was just the thing to support an aerial.

Captain Ferrié, who had given much time to developing wireless apparatus for the Army, was put in charge of installing a small plant of about 15 horse-power simply to see what could be done with it. This experimental plant at once proved very useful in sending out time signals and weather reports to ships at sea and for the Navy Department to issue orders to Naval Commanders, but its greatest value was

shown during the Moroccan troubles when the War Department was able to keep in direct touch with the Army there through its station at Casablanca.

The need of a new, permanent, high-powered station was strongly felt and work was commenced on it in 1908. Now instead of a couple of makeshift shacks at the base of the tower a concrete building was put in under the ground so that its roof was on a level with the surface of the park. This was done in order that a clear view across the grounds could be had and also to prevent the noise of the sparks from being heard in the neighborhood, which would not only be disturbing, but, what mattered more, any one who knew the Morse code could read all the outgoing messages a block away.

When I got settled in Paris I struck out to see the Eiffel Tower station. I found it was just about to be opened and it was my intention to try to get a job there for I believed it would be the only way I'd ever get to see the installation.

I asked a *gendarme*, as they call an armed policeman over there, who was standing hard by, where the office of the wireless station might

happen to be—that is, I asked him in the deaf and dumb alphabet, and I gathered from the motions he made with his hands and arms that it was in the underground building. I hied me down the stairs and found myself in a small, central area-way from which doors around it opened into the office, receiving, dynamo and sending rooms.

Not being able to read French, as I explained to some officials afterward, I had carelessly opened the door on which the sign read *Bureau de Transmetteur* instead of *Bureau de Telegraphie sans Fil* with the result that I saw the whole blooming sending apparatus. There were two operators in charge but they didn't think I was worth noticing.

The sending apparatus was very much the same as that I saw in the cableless station at Glace Bay. This is easily explained because there is only one way to change a large amount of low pressure electricity such as is generated by an alternating current dynamo into high potential, high frequency electricity and that way is to use a transformer to *step up* the pressure of the alternating current; condensers are then charged with the latter current and this

in turn is discharged between a pair of spark balls, or a rotary spark-gap which is used for the same purpose.

Not having been thrown out of the sending room and having seen all there was to see I opened the door to the *Bureau de Recepteur* and took a good look at the receiving apparatus. The detectors were of the *electrolytic* type, each of the cups which contained the solution having three wires sealed in it instead of one; this was the invention of Prof. Branly of Paris who got up the *coherer* several years before Marconi began his experiments in wireless.

The door of the *Installation d'Alimentation Electrique* was open and I glanced in at the dynamos, motors and storage batteries and from the size of its equipment I judged the station to be about 100 horsepower. Having seen it all I opened the door of the *Bureau de Telegraphie sans Fil* and walked in just as we do in offices over here.

Somebody must have told the *Directeur*, or *manager* as we would call him in good old English, that I was coming for before I could explain in sign language that I wanted a job he, with the aid of a couple of other conspirators,

hustled me unceremoniously out, up the stairs and on to the green grass of the park. No, it wasn't exactly a case of *sour grapes* but after I had seen the apparatus of the station and added it to my Christian Science collection I didn't want the job anyway.

The most interesting feature of the Eiffel Tower wireless station is its aerial and before I left I studied it carefully. It is a one-sided affair, but this is not because its designer thought well of it but in virtue of the fact that the Eiffel Tower sets at one end of the Champ de Mars.

If the tower had been built in the middle of the park the wires could have been brought down all around it on all sides thus forming what is called an *umbrella aerial* and this would have been *good practise*, as the engineers say. As it is there are six steel cables about $\frac{1}{2}$ an inch in diameter secured to but insulated from the top of the tower on one side and these are guyed out in the shape of a fan and anchored at the other end of the park.

The cables are set in stone posts which project above the ground and to prevent simple folks from laying their hands on them, in which

case their bodies would become conductors and allow a few million volts of high potential electricity to pass through them, the posts are surrounded by iron fences. The main cables are connected together about half-way between the ground and the top of the tower with other and lighter cables and these are joined to a single leading-in cable which runs down to and passes through a window to the top of the area-way in the underground building.

Finally the leading-in cable is connected to one end of a tuning coil, the other end of which is joined to a *ground* formed of metal plates having nearly 3000 square feet of surface and these are buried deeply in the earth far below the underground building.

Before I left the States to get the Eiffel Tower station the Navy Department had contracted with the *National Signaling Company*, an American wireless telegraph concern, for the most powerful cableless plant that had yet been built.

While I was in France work had been started on the towers and buildings at Arlington on the Potomac River near Washington and the machinery and apparatus for it was being built.

After my return, with some jockeying, I landed a position with the *National Signaling Company* in the testing department and so had the opportunity of watching the whole installation grow up of which I shall tell you presently.

Finally when every piece of apparatus had been built and given exhaustive tests the equipment was shipped to Arlington, or, as some would-be high-brow tried to rename it, Radio, and the engineers and working force of the Company were sent to Arlington to install it, get it into working order and make the final tests required by the Government before the latter took it over.

When we reached Washington I could see the three great steel towers at Arlington looming up as high, it seemed to me, as the Washington Monument itself. On reaching the Arlington station which sets on the crest of a hill in a corner of the Fort Myer Reservation, the towers did not look so high, nor were they, for the tallest one was about 600 feet and the two shorter ones were 450 feet high. These three towers formed a triangle, the distance between the two shorter ones being 350 feet, and 450 feet between the taller and shorter ones. These

towers, which were complete and ready for the aerials, rested on concrete bases and were insulated from the ground by slabs of marble. There are three buildings and these were also ready for the installation.

Now while the machinery and apparatus were being moved into the buildings and set in place a force of men was put to work on assembling the aerials and swinging them between the tops of the towers. These aerials are known as T, or flat-top aerials and right here I want to tell you how and why this type of aerial came to be.

In the early days Marconi, and those who followed him, thought that a high vertical wire, that is, one sticking straight up in the air, was all that was needed to get distance. On ships the masts are never very high and so the late Lieutenant Hudgens of the U. S. Navy tried stringing the wires of the aerial down to the bow and stern of the battleship *Kearsarge* to give the wires a greater length. This sloping aerial gave so much better results than the straight, or vertical aerial that he then suspended the wires *between* the top of the masts of the ship and, lo-and-behold, it worked even

better than before and thus it was that the T, or flat-top aerial came to be.

To get the best results the aerials of two stations communicating with each other should both be vertical or flat-top, that is, a vertical wire will not receive from a flat-top nearly as well as from another one that is vertical and this is just as true the other way about. As all ships are fitted with flat-top aerials and as the Eiffel Tower aerial is neither the one kind nor the other but a sloping aerial and hence would receive from a flat-top as well as from a vertical aerial the Navy Department decided to use the T or flat-top aerial on the Arlington station.

We assembled, tested and put up the three flat-top aerials between the towers and connected them together so that in effect a single long aerial was formed. Porcelain insulators of the kind on which high tension power transmission lines are carried are used to insulate the aerials from the towers. The leading-in cable runs from the aerials to which it is connected down to the operating room through a copper tube set in a glass window.

The ground is formed of copper wires buried

deeply in the earth and radiating in every direction from the station. This network of wires extends over, I should say, ten acres, and this, of course, makes a very good ground.

The current for energizing the sending apparatus is taken from the lines of the *Potomac Light and Power Company*; this runs an electric motor of 200 horse power which in turn drives a 100 kilowatt alternating current generator; the current from the latter flows through a transformer which raises the pressure of it to 25,000 volts. Next a battery of *compressed air condensers* are charged with this high voltage current and this is discharged by a rotating spark-gap. This spark-gap has a wheel, on the rim of which is set a number of metal points, or *electrodes* as they are called, and around them are an equal number of fixed metal points or electrodes.

When the wheel revolves sparks are made only when the electrodes on the wheel and those that are fixed around it are exactly in a line. Now instead of a few big sparks taking place every second, a thousand smaller ones occur in a second and this makes a whistling sound which is heard by the operator who is *listening*-

in at the distant station. The high frequency currents set up by the spark-gap then surge through an *oscillation transformer* which increases its pressure and finally into and through the aerial wire system where they are damped out in long electric waves.

The Morse telegraph key is placed in the receiving room and it works a *control switch* in the sending room. The control switch breaks up the current that flows from the generator into the transformer into dots and dashes.

The receiving instruments have both *electrolytic* and *crystal detectors*, the other parts being made up of the usual variable condensers, tuning coils and oscillation transformer and head-phones.

Well, at last everything was all ready for the final company test and I was mighty glad of it for things were getting very much on my nerves. A cableless station is altogether too big and cold-blooded a proposition for a fellow who likes a little excitement once in a while.

The Navy Department had fitted out the cruiser *Salem* with a sending and a receiving apparatus exactly like that of the Arlington station except it was very much smaller.

On February 13, 1913, the *Salem* sailed from the League Island Navy Yard at the mouth of the Delaware River for the Mediterranean Sea so that the official tests of the Arlington station could be made. The letter *D* was used for the test signals and we sent these out from Arlington for 15 minutes each time before the messages were transmitted.

Officials from the Navy Department gave us the messages to send and we were allowed under the terms of the contract to repeat each message three times to make sure the *Salem* got it, but no more. The *Salem* then followed by sending the test signal *D* and after this she sent four messages which the Captain gave her operators. This exchange of signals and messages was made twice a day throughout the *Salem's* voyage across.

The messages we sent from Arlington were received by the *Salem* up to a distance of 2,375 miles, while the messages sent by the operators on the *Salem* were received by Arlington up to a distance of 1,000 miles. Far greater distances were covered by both the shore and ship stations but they were not accurate enough to

meet the conditions called for by the Navy Department.

At night when the ether is quiet, as is always the case, the messages from both stations were sent and received over greater distances than by day and we were able to read what the *Salem* sent when she was out 1,600 miles and her operators got us up to 3,200 miles. Even when the *Salem* reached Gibraltar she could get Arlington's signals but they were so feeble she could not take down our messages.

The National Signaling Company having successfully completed the tests imposed by its contract with the Government now formally turned Arlington station over to the Navy Department and having added that great station to my collection I was ready to get back to the big town.

CHAPTER VIII

ABOARD A WARSHIP AT VERA CRUZ

TROUBLE was brewing down in Mexico. Did I say *was* brewing? Well, what I should have said is that it *had* brewed, and will keep on brewing until Uncle Sam goes down there and cleans out Villa and all the other bandits and revolutionists.

You say the *Monroe Doctrine* won't permit it? Now there you've got the best of me; I have a very hazy idea of what the *Monroe Doctrine* means but I've had occasion to observe that whenever a country can't govern itself or the ruler of some country wants to govern the whole world Uncle Sam just naturally drives a gun carriage through the *Monroe Doctrine* and settles the affair to everybody's satisfaction once and for all. He is very like a school teacher who is so much annoyed by a couple of his pupils that are constantly arguing and fighting he finally gets mad himself and licks both

of them and then things quiet down and become decent like.

Getting down to cases, though, what I mean is that trouble was brewing between Mexico and the United States. The Mexicans had been fighting a long time among themselves; Madero who had been president of the republic was shot and killed; Huerta, an Indian of Aztec stock, was president at that time and he carried things on with a high hand, while Carranza, a rebel who wanted to be president, was, with the aid of Villa and other revolutionists, doing his best to wrest the government from him.

Your Uncle Sam thought about as much of President Huerta as he thinks now of the bandit Villa and would not recognize him as the head of the Mexican Government. His attitude naturally made Huerta very sore on the United States and, as I remarked before, trouble was brewing, for Huerta had been doing small, contemptible things to aggravate the United States and now he pulled off another low down trick.

It came about like this: in April, 1914, the U. S. S. *Dolphin* anchored in the bay of Tampico, Mexico, and the paymaster of the ship and some marines went over to town in a launch.

Their object in going ashore was to buy some gasoline but before they had gone very far a number of Huerta's Mexican soldiers arrested them, led them through the streets with a howling mob of *greasers* after them and then threw them into jail.

Rear Admiral Mayo of the *Dolphin* soon learned of the predicament of his men and demanded of the Commander of the Mexican army to set them free immediately, if not sooner. The Commander, knowing full well what would happen if he tried to hold the marines, let them go and apologized for the *mistake*, as he called it.

But the Admiral was not the kind of an officer to let the Army or any other branch of the Mexican Government insult our men and get away with it. He therefore avowed that the Huerta government should salute our flag by firing guns and that this must be done on or before a certain hour.

In the meantime the Admiral communicated the incident to our government at Washington and this was done by sending wireless messages from his flagship to our Darien wireless station at Camento, Panama, and from there it was

retransmitted to Arlington. The Darien station which had been completed only a little while before, has a sending apparatus equal in power to the Arlington station but it can send and receive farther than the latter station because all three of its towers are 600 feet high.

Mr. Bryan, who was then Secretary-of-State, got in touch with Mr. O'Shaughnessy, the U. S. *chargé d'affaires* in Mexico City, and he took up the matter with President Huerta. The erstwhile President of Mexico also apologized profusely, believing that he could in this way get out of saluting our flag. Our government insisted that apologies were not enough but that the Mexican Government must salute our flag as Rear Admiral Mayo had ordered, and this Huerta finally agreed to do.

Knowing the Mexican disposition, whose watchword is *mañana* (which means *to-morrow*), and having every reason to believe that there would be a hitch in the proceedings, the Admiral extended the time in which the salute was to be given to May 12.

As before, the 12th went by and the New York papers stated that Huerta had failed in his promise to salute the flag. I *doped* it out

that there would be big *doings* down there and, unlike the *greasers*, I did not let *mañana* interfere with my patriotic obligations to Uncle Sam, but I went right over to a recruiting station on 23rd Street and enlisted in the Navy as an "electrician for wireless telegraphy."

At that time a man who wanted to enlist in the Navy as a wireless operator had to have "a working knowledge of telephones, measuring instruments, call bells, etc., and he must be able to connect up same to batteries and make minor repairs to them." Also "familiarity with ordinary telegraph instruments while an aid in acquiring a working knowledge of wireless telegraph instruments, is not an essential qualification for enlistment as a wireless telegraph operator."

This is what the enlistment circular I was given to read said but, of course, it was meant for men who knew a little about electricity and nothing about wireless telegraphy to start with. But here I was a full fledged operator, who had worked with Marconi and had helped to install the equipment in the Arlington station!

The circular went on to say that "applicants would be enlisted as *electricians, third class*, at

\$30 per month. Some come-down for a man who had been a *first wireless officer* on a transatlantic liner and who had earned, at least on one round voyage, \$200 a month, to say nothing of one who had worked with Marconi!

As I read on, the circular further stated "that men detailed as operators will be eligible to be promoted to higher ratings when they qualify as operators and have served the required probationary time under the regulations through the successive grades to chief electricians at \$60 per month when they prove their ability to take charge of the wireless telegraph station and interior communication on board ship and have been assigned to duty."

A man who knew nothing about wireless but wanted to become an operator was given a course of instruction at some naval wireless school or wireless telegraph shore station and when he was proficient enough he was assigned to a cruising ship either in charge of a station or else as an assistant to the electrician in charge.

As expert wireless operators were always in demand in the Navy I was at once assigned to the *Alabama* as an assistant operator and it

was not long before I was rated as a first class electrician.

I joined the *Alabama* over at the Brooklyn Navy Yard, at New York, where she had been in dry-dock undergoing repairs and the next day we rode down the East River, through New York Bay and out to sea where we joined the North Atlantic Fleet under the command of Rear-Admiral Fletcher.

Surely enough, we got the news from Arlington on the 18th that Huerta had put off saluting the flag though still agreeing he would do so; President Wilson was heartily tired of it all and he finally sent an *ultimatum* to the sly old fox at Mexico City. This was to the effect that if he did not salute the flag by 6 o'clock of the afternoon of the 19th he (President Wilson) would ask Congress the next day to permit him to send the army and navy to Mexico to force him (Huerta) to do so.

To see that this was done on schedule time we received orders by wireless to sail on the 14th to Mexico. The *North Atlantic Fleet* was formed of some thirty-six warships, and these were manned by no less than 15,000 blue jackets and marines.

We were soon heading south. Talk about cleaning up Mexico! Why, we had a fleet that could have cleaned up the world, and a mighty pretty sight did she make, too. When we got there the fleet was split up into two squadrons, one going to Tampico and the other, to which the *Alabama* belonged, going to Vera Cruz, the Atlantic port nearest to Mexico City.

From what I gathered from the officers the purpose of President Wilson was not to make war on poor old war-ridden, moth-eaten Mexico, but simply to blockade the ports of Tampico and Vera Cruz and take over their customs houses until such time as Huerta could see the necessity of ordering the Commander of the Mexican Army to salute.

Two days later when we were steaming at full speed for Mexican waters, I caught the message that Huerta had again agreed to salute and since he knew we were coming I believed that he would do it this time sure and that our next orders would be to steam to northern waters. I was out of luck, that's all. But we kept right on going just the same.

What Huerta really said was that if his Army fired the salute it would be right, he

thought, for our Navy to salute in turn. Huerta was informed that this was always the custom when salutes of this kind were fired and that our Navy would, of course, return it.

We learned by wireless the next day that Huerta had again flopped over and he now wanted the salute to be fired gun for gun, that is, his army would fire the first gun, then our fleet would fire the next one and so on. Not only this but he wanted President Wilson to sign some kind of a paper and tied the whole proceedings in a hard knot with a lot of other strings. These conditions which Huerta wanted to impose President Wilson would not agree to and there was nothing else left for him to do but to back the ultimatum on the day he said he would.

On the way down I had plenty of time to look over the *Alabama*, to get acquainted with the men and to get my bearings. I can't tell you here the little things that happened on board but I must say a word about the *Alabama*.

The battleship, in her day, was the giant of all the sea-fighting craft and her *armor*, that is, the steel covering that protects her, is a great piece of work. First of all the whole main deck

is made of thick sheets of steel called *armor plate* and this covers the ship from her stem to stern-post just above the water line.

The part of a battleship where a shell hitting her would likely do the most damage is at her water-line and if a shell should hit there and explode it might tear out a big hole when she would quickly fill with water and sink. To prevent this from happening a very thick band of steel armor plate is riveted all the way round her at the water-line.

All the machinery and equipment of the ship including her engines, boilers and machinery, the powder magazines and shell rooms, the passageways through which the ammunition is taken, the wireless room, in fact everything except her guns, is in the hold below this strong deck. Of course there must be some openings in this deck but these are protected by gratings of heavy steel, the bars of which set closely enough together to keep fragments of shells from going through should one hit and explode on deck.

On our battleships the main battery is generally made up of four 10 inch, 12 inch or 13 inch

breech loading guns and these are mounted in revolving turrets one of which is forward and one aft. The *Alabama* had four 13 inch guns in the large turrets and twelve 6 inch guns on the broadsides. I'm telling you that if Huerta had been at Vera Cruz when we got there and taken a look into the muzzle of one of our 13 inch guns he'd have saluted the flag without any more of that mañana business. As it was he was safely out of range of our guns for Mexico City is over 200 miles from Vera Cruz.

In the early days of wireless when every Tom, Dick and Harry was getting up a "new" wireless system the *Navy Department* tried out all of them. It would not use the Marconi system because the government wanted to buy the apparatus outright while the policy of the *Marconi Company* was to lease their apparatus.

The favorite type of wireless apparatus used by the *Navy Department* was known as the *Telefunken*, a German getup that was a combination of the Slaby-Arco and the Braun-Siemens and Halske systems. The transmitter of our station was one of this kind and consisted of an induction coil with a mercury turbine in-

terruptor, an electric motor to run it and the usual key, loose coupled tuning coil and condensers.

The receiver was of a later type and had both a *crystal detector* and a *vacuum tube detector*, the latter being the invention of Dr. Fleming of England who has been Marconi's technical adviser for many years. This detector is really a small incandescent lamp bulb with not only a filament but a metal plate sealed in it. The filament is kept at a white heat by a current from a storage battery.

When the telephone receivers are connected to the hot filament and the cold plate electrodes, the high frequency currents that are set up in the aerial by the incoming electric waves are changed into direct currents and the varying strength of these act on the head-phones. This detector is very sensitive and needs no adjusting.

Many of the messages we sent and received were in straight English but nearly all the important ones, especially those for and from Washington, were in code, the purpose of which was to prevent any one else, except our officers, from reading them and this kind of mes-

sage is not very interesting but we know that something is going on anyway.

We anchored off Vera Cruz on the 21st and the natives must have thought from the number of warships that hemmed them in that we were going to blow them to smithereens. A few hours after our arrival we landed a thousand marines and they drove back Huerta's soldiers and captured the customs house.

The chief reason this was done was because our government had got wise to the fact that a couple of German ships were scheduled to arrive at Vera Cruz with a cargo of guns and ammunition for Huerta, and our Commander had received orders on the way down to prevent this by seizing the customs house.

There was not much show of armed resistance on the part of Huerta's men but in the scuffle that took place four of our men were killed and about twenty were wounded. I made up my mind right then and there that if I ever got a chance I'd blow the sombrero off of some greaser out of pure revenge.

The favorite method of warfare that is waged by the Mexicans is *sniping*, that is, they hide behind something and take a shot now and then

at you. As a result of sniping a few days later the number of our men that had been killed was brought up to eighteen and the number of wounded to 71.

When things had quieted down Hart Douglas, another operator and I got a six hour shore leave. We buckled on our holsters and slipped our revolvers into them with small thought of having a chance to use them. We took a look around the town and all went well for awhile when *zip, zip*, a couple of bullets whizzed by my ear and Hart dropped with a bullet in his lung.

I whipped out my gun and wheeled around just in time to spot a couple of snipers lying on a near-by roof with their rifles pointing toward us. I emptied the five chambers at them as fast as I could pull the trigger. I got one of them; he raised himself to his feet and pitched headlong into the street. But the other one got me for he drew a bead on my gun arm which, also don't forget, is my key arm. A couple of marines put poor Hart on a stretcher and carried him over to a field hospital. Another bound up my arm, walked with me over to



"I WHIPPED OUT MY GUN JUST IN TIME TO SPOT A COUPLE OF
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the launch and when I got aboard my ship the doctor dressed it.

No more shore leaves were granted the men because two perfectly good operators had gone ashore and two miserable good-for-nothing operators had returned. Hart hovered between life and death for weeks but he finally pulled through though he never will be as good a man as he was. I came along all right but my hand seemed paralyzed from the wrist down and it was many a moon before I could use a key again with my right hand. I guess you see now why I like those greasers so well.

Our marines remained on duty until the end of the month when General Funston arrived from Galveston with about four thousand troops and took possession of the port. It was hard to see what turn affairs would take next for Huerta had an army of 5,000 men not very far from Vera Cruz. But I guess he had heard of General Funston before and he didn't care about being captured as Aguinaldo, the Philippine leader, was.

Instead of having some small war the diplomats of the A B C governments of South

America, as Argentine, Brazil and Chile are called, offered to try to negotiate a friendly settlement between the United States and Mexico. President Wilson, who liked peace and hated war, at once accepted their kind offer and agreed to send representatives to their proposed conference. The following day Huerta agreed to send his representatives to the A B C conference which was to be held in the town of Niagara Falls on the Canadian side of the river.

Finally, when all the representatives met, the first thing that was done was to have an armistice signed by the United States and Huerta's government. As soon as this was done Huerta's representatives tried to have the United States withdraw its forces from Vera Cruz and the United States forego the salute for the insult to our flag. The representatives of the United States asked only that Huerta resign.

After deliberating for five weeks the representatives of all the countries agreed that a provisional government should be established in Mexico, and that Huerta should resign; that the United States should not ask Mexico to pay

an indemnity nor to ask for a salute or other apology for the insult to the flag at Tampico and that our troops were to remain at Vera Cruz.

In the meantime Huerta was being hard pressed by Carranza on the north and the rebel Zapata on the south and with our troops occupying Vera Cruz it evidently suited him very well to resign. So on the 10th of July Huerta appointed Chief Justice Corbajol to be president in his place.

It was common talk among the blue-jackets on our ship that Huerta had some 3,000,000 dollars deposited in banks somewhere in Europe and that he planned to go there. Be that as it may he handed in his resignation to the Chamber of Deputies a week later and left for Puerto, Mexico, on a special train under heavy guard. From there he sailed for Jamaica and thence for Europe.

Thus it was that Huerta, the Indian descendant of the Aztecs, who always went one way and came back another, got out of saluting our flag and probably saved his life.

CHAPTER IX

ON A SUBMARINE CHASER

VERY shortly after Huerta resigned the presidency of Mexico and made his getaway, the ex-Kaiser let loose the war-dogs of Europe and here I was signed up for four years in the Navy and, I figured, didn't stand a ghost of a chance of breaking into the fight. It seemed to me a pretty tough deal that old Huerta could resign his job while I, a free American citizen, couldn't quit, resign, go-over-the-hill, or anything.

What I wanted to do was to get over to England and *sign up* there for it was dollars to doughnuts in my mind that there would be some small bickerings going on between the British and the German navies and it would be well worth while to see those big guns get into action. I hadn't the remotest idea, then, that the *Imperial German Navy*, as those *boches* so loved

to call it, would be afraid to come out in the offing and put up a fight. But when it came to torpedoing unarmed passenger ships loaded with women and children, or hospital ships carrying wounded soldiers they were right there Fritz-on-the-spot with their *blackheads* as they called their Whitehead torpedoes.

While the ex-Kaiser's navy could not be induced to leave its mine-protected harbors and do battle with the British fleet—no, not even if all Germany starved to death—crafty, old Admiral von Tirpitz began to build up a frightful fleet of U-boats with the avowed intention of sinking every merchant ship, no matter what flag she flew, if she carried foods or munitions to England and her Allies.

As the United States was shipping cargoes of both of these commodities to Great Britain and France, which was entirely within her rights according to international law, it was not long, as you can imagine, before the German U-boats were sinking our ships and killing our men.

It was bewhiskered Admiral von Tirpitz who figured out and showed the ex-Kaiser that the only way left open for Germany to win the war

was to sink every ship afloat that did not fly the German flag, and soon after this program was agreed to by the war-lords they seemed in a fair way to succeed, for they were sinking ships faster than the Allies and the United States could replace them.

Any number of schemes to beat the U-boats were thought up and while most of them were quite impracticable there were a few that proved effective when put to the test. One way was to build more merchant ships every month than the U-boats could sink and when Uncle Sam put the job into Mr. Schwab's hands this was done. Another plan was to hunt down the U-boats with *submarine chasers*. A submarine chaser is a small, high-speed boat carrying one or more rapid fire guns.

As you know a submarine can shoot a torpedo at the biggest ship afloat and if it hits her she is sure to sink in a few minutes and yet it is the easiest thing in the world to send a U-boat to the bottom if you can only get a chance to land a shell on her.

Just before we got into the war Germany built two great submarines each of which was over 300 feet long. One of these U-boats was

the *Deutschland* and the other was the *U-53*, and both had a cruising radius of about 5,000 miles, that is, they could travel that distance without having to take on food or fuel.

No one here ever thought that a submarine could make a trip across the ocean but the *Deutschland* did it. She left Bremen, Germany, and submerged while in the river, then she slipped out into the seaway under the British fleet that had the German warships bottled up, made the passage of the North Sea on and under the water, thence through the English Channel going this dangerous route entirely under water and across the Atlantic Ocean during which she submerged only when she saw some of the Allies' warships.

Then one fine morning, 16 days later, she came to the surface in Chesapeake Bay and docked at Baltimore. There she unloaded a cargo of dye-stuffs and synthetic gems and took on a cargo of rubber, and, what was of more importance, secret papers which Count von Bernsdorf, Germany's ambassador to the United States, could not trust to go any other way. On sailing she made her way to the mouth of the bay, submerged to escape the British ships

which were laying in wait for her beyond the three mile limit and returned to her home port. Later on she made another round voyage with equal success.

When we got into the war it was clear that we had a *war-zone* right here at home and one that was not to be sneezed at, for, since a submarine could be built large enough to travel the whole distance from Europe to America without having to be convoyed by a base, or *mother-ship* as she is called, Germany could as easily send over to our shores one or a dozen submarines as large as the *Deutschland*, fitted out with rapid-fire guns and torpedoes and do a lot of damage to our shipping and even to our cities. The *Navy Department* believed that the best way to protect our coast was to build a large fleet of U-boat chasers and this work was gone ahead with as fast as possible.

Now while I can use a key with my left hand nearly as well as I could with my right, still my arm pained me a good deal and I could have gotten a long leave of absence if I had asked for it. So when I told the commander I wanted to be transferred to a U-boat chaser he fixed it O. K. for me and I was assigned to the *Second*

Naval District which patrolled from Newport to the First and Third Naval Districts.

The chaser I was assigned to was a brand-new one just off the ways and of the very latest type; she had a length of 110 feet, a beam a little under 15 feet and a draft of about 4 feet. She was built chiefly of wood but she had a pair of steel masts and a crow's nest for the *lookout* whose job it was to watch for U-boats. She was powered with a steam engine but instead of coal she burned oil under her boilers. Her large size made her very speedy and she could do 25 knots, if she had to, which was twice as fast as the fastest U-boat could do.

The aerial was stretched between her masts and the leading-in wire was connected to it near the rear mast and followed it down to the deck where it passed through an insulator in the latter, and on into the operating room. This was about the smallest space I ever got into which was graced by the name of an operating room but I had no *kick* coming as we were not afloat all the time.

The sending set had a $\frac{1}{2}$ kilowatt transformer and the receiving set was fitted with both crystal and vacuum detectors; the whole space

taken up by them was probably not more than 5 cubic feet. Well, so much for the chaser.

There were only 14 men in our crew and there was far less formality on board than on a battleship. Bill Adams and I got to be pretty good pals. The first time I met him he was trying out one of her Hotchkiss semi-automatic guns and I was watching him.

"Where did you get that chunk of mud?" he queried as he pointed the gun at an imaginary U-boat.

"Speaking to me?" I asked in turn.

"You said it," he replied bluntly.

"If you refer to the sparkler on my annularis finger I have to inform you, sir, that it came from the land of the Raripunas about 1500 miles up the Amazon river," I explained with great perspicacity.

You see, I had had the diamonds cut that Princess Mabel gave me and the one I wore was a *regent* weighing about 2 carats and it was mounted in a Tiffany setting. In fact it was altogether too big a diamond for any ordinary blue-jacket to come by honestly.

"That's where it came from, but I'm askin' you, as man to man now, where did *you* get it?"

"Right where it came from," I put it straight back to him.

If it hadn't been for my *game* arm I guess Bill and I would have settled the mooted question as to where my *chunk of mud* came from by referring it to the court of last resort, by which I mean the manly art of *hit-'em-again, gob*.

"Put up your dukes," commanded Bill at the same time striking an attitude of a gas-house slugger.

Now to get my right hand up I had to lift it with my left and when Bill saw this he yelled, "time, you win!"

Then his eyes softened, his voice lost its harshness and he became sympathetic. He wanted to know how it happened and all about it. And then we got the matter of the chunk of mud straightened out to Bill's satisfaction. From that time on Bill and I were pals and we used to swap stories. He had been in every corner on the face of the earth except South America and his stock of experiences was a large one. To keep even with him I had to manufacture tales out of raw material as I went along and I often thought he did the same

thing. Say, he certainly put over some regular crawlers. He never got tired of talking about the prospects of mining diamonds in Brazil and all I had to do to get him going was to flash my sparkler on him and he was transported as if by magic to equatorial South America.

Like dozens of other fellows I have met, Bill was a strange contradiction of brains in that he was a natural born hard boiled egg and yet when a fellow needed a friend he was as compassionate as a Salvation Army lass in a trench under fire; again he was ignorant, yet wanted to learn. For instance he wanted me to teach him wireless; it was all vague and intangible to him. He had to have something he could see in three dimensions instead of having to visualize it in his mind; his one big talent lay in his being able to hit a target with a projectile of small or large size and accordingly he was able to serve his Uncle Sam nobly and with telling effect.

You may or may not know it but a fellow can join the navy and live aboard ship a long time and still know but very little about any part of her, except his own particular branch, unless he keeps his eyes and ears open and talks

with fellows who know and can and will answer his questions intelligently. Bill was ignorant when it came to book-learning but he knew all about submarines and submarine chasers from their bottoms up.

I had asked him why it was that a torpedo from a U-boat couldn't hit a submarine chaser and also to tell me something about the fighting qualities of U-boats.

"You see, matey," explained Bill wisely, "the torpedoes made for the Kaiser's U-boats are adjusted so that after they are shot from their tubes they run through the water at an even depth of between 8 and 9 feet below the surface. Now a boat of any size draws far more water than this and, of course, if the torpedo hits her at all it will be below the water line and she goes down. But this chaser of ours draws only 4 feet of water and so a torpedo, if it behaves itself, would pass clean under her and never touch her.

"The trouble is," he went on, "that there never was a torpedo made that stuck to its course and it is liable to shift to the port or starboard or to come to the surface and for this reason we never take a chance but dodge them.

You can always tell when a torpedo is coming by the thin white wake she makes on top of the water and while a ship can't get out of its way, a speedy little boat like ours can make a quick turn and give it a wide berth."

"Who got up the idea of a submarine chaser?"

"Well, that I don't know about, matey, but I do know that when Germany sent out her first U-boats to the coast of Great Britain to sink her ships, all sorts of motor boats which had a length of 40 feet and over were pressed into service; these boats had guns mounted in them and they combed the sea in search of the submarine enemy.

"The first German U-boats were slow old craft and they stuck close to the coast where the ships were the thickest. This made it easy for the British armed motor-boat patrols to hunt them out and send them to the bottom. It was soon seen that larger and faster patrol boats carrying heavier guns were needed to keep up with the newer and faster U-boats that were sent to take the place of those the British sunk and so speedy 80 foot boats were built specially for patrolling.

“By the time we got into the war the U-boats were so big and fast that to catch them we had to have regular torpedo boats, except they are without torpedoes, built to run them down and this is exactly what this chaser we are now on is. With our chaser we can go twice as fast as any U-boat the Germans ever sent out and I’m telling you, matey, that if I ever spot a U-boat coming to the top and she is inside the range of this Hotchkiss her crew might just as well kiss the Kaiser good-night.”

The way the submarine chasers work is like this: A base is set up on shore close to that part of the coast waters, or *zone* as it is called, that a squadron, which is formed of a dozen chasers has to patrol. The shore base is fitted up with living quarters for the crews of the chasers, besides reserve crews who may be needed in an emergency, and there are also artificers, that is mechanics, carpenters, painters, etc., who stayed on shore so that when we were relieved from duty and came in, our boats were looked after as carefully and overhauled as thoroughly as a millionaire’s automobile.

The base also has a wireless station and any chaser can get in touch with it should occasion

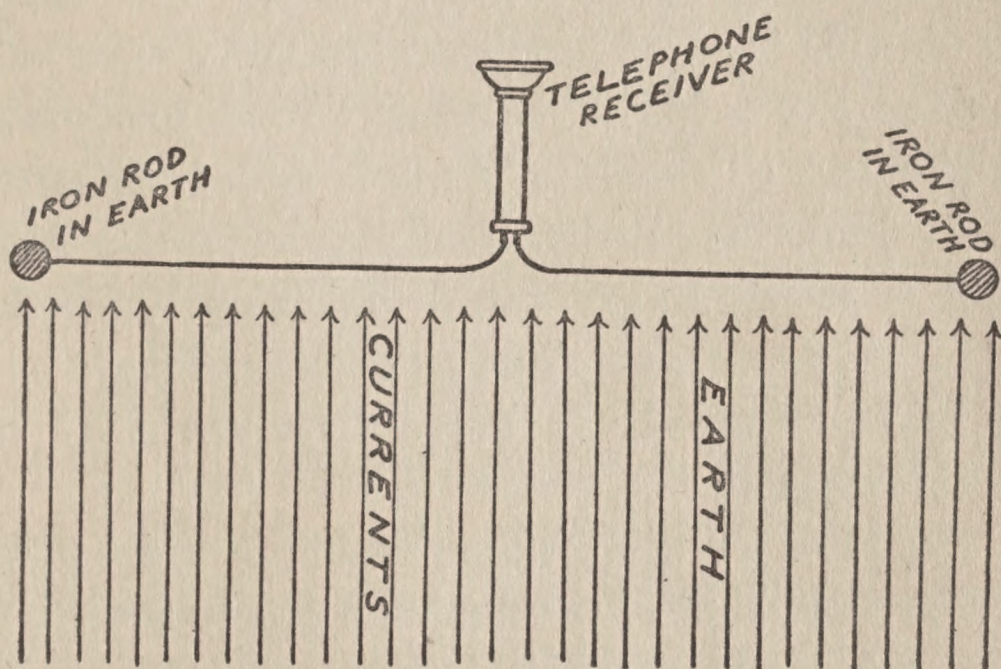
arise for her to do so. Each base also has one or more destroyers which carry heavier guns and these are stationed near by so that should the enemy loom up and prove too much for the guns of our chasers the larger boats can be signaled to help.

When a squadron of chasers leaves its base for the zone it is to patrol it is split up into two divisions of six boats each and a *division officer* is in charge of each one. Each chaser is given a certain area to patrol and she works with all the other chasers in her squadron, the shore station and ships at sea. If a U-boat has been sighted at sea, the ship who has picked her up immediately sends a wireless message to the base which in turn informs the commander of the squadron.

Should a U-boat venture into one of our zones the chasers get as busy as hornets and scout around until she either slips away or comes to the top to enable her commander to take a look around through his periscope to see if there is a ship in sight worth using a torpedo on.

Besides the regular wireless set each submarine chaser is fitted with a *sound conduction*

signalling system and this is used to detect the presence of a U-boat when it is submerged and cannot be seen, though to do this the enemy boat must be near-by. This conduction scheme is very simple and you'll get me fine as I explain it.



Water, as you know, conducts sound waves to much greater distances than air does. You must have often made the experiment when in swimming of ducking your head under water and listening while another fellow would strike a couple of stones together under water at a distance of thirty or forty feet away from you;

and yet you could hear them click as they struck each other as plainly as you could in air a couple of feet away.

Now, signalling between submerged submarines or a submarine and a chaser is carried on on exactly this same principle, that is by the conduction of sound waves through the water. To do this kind of wireless signalling each submarine has a high-frequency sound producing apparatus, or *oscillator* as it is called, attached to the hull. It consists of a diaphragm, or disk, that is set into very rapid vibration by means of an electromagnet, just as the diaphragm of a telephone receiver is made to vibrate by its electromagnet.

The disk, or diaphragm, which is very much larger than that of a telephone receiver, sets in the water and when it is made to vibrate by closing the circuit with the key it sends out trains of sound waves to considerable distances through the water.

The other submarine, or chaser, is fitted with a like disk which is fixed to a *microphone*, or telephone transmitter, and to this a battery and telephone receiver is connected. When the high frequency sound waves from one submarine

reaches the second submarine they impinge on the disk of the microphone when it vibrates; this varies the battery current flowing through the microphone and you hear the dots and dashes in the receiver.

Now when a U-boat, or any other kind of a power vessel, gets within a certain range of the chaser the hum of the machinery in her sets the hull into vibration and you can hear it in the receivers. So, you see, whether a U-boat is afloat or submerged it is pretty hard for her to escape the eternal vigilance of the chaser.

We had received word by wireless that a U-boat had been sighted about a hundred miles off the coast and that she was one of gigantic size. We swept our area with great zeal, the lookouts in the crow's nest being changed every two hours; the gunners were at their guns ready for instant action and John Paul Jones Boggs, the other operator and I took turn about listening-in.

I don't want to brag about myself but I found out a long time ago when I was a kid operator back home that I had a more sensitive ear than any of the other fellows, that is, I could differentiate dots and dashes and take down mes-

sages that they could only get as a jumble of signals. Later on I began to experiment with head-phones and tried out every make I could get hold of in order to find one that was particularly sensitive and especially suited to my ear.

When I was chief wireless operator on the *Andalusian* I met operators from all over the world. Once when I was in London I scraped up an acquaintance with a young Swede and he had about half-a-dozen pairs of head-phones that he had picked up in different countries. Telephone receivers for wireless work are like violins in that no two of them are alike and you can't tell by their appearance what they are really worth; like violins, too, telephone receivers improve with age provided the magnets are made of the right kind of steel and properly tempered.

One of the pairs of head-phones this Swede operator showed me was made in Sweden by the *Ericsson Telephone Manufacturing Company*, and it was by far the most sensitive phone I had ever used. I bought the pair of him for a *sovereign* but they are worth their weight in gold. With this pair of Ericsson's on my head

I was listening-in for all I was worth. I kept this up intermittently for about 6 hours when I was rewarded by hearing the faint whirring sound of a propeller. I reported it to my commander and he said it was a U-boat all right.

He had our engine stopped so that I could hear her to the best advantage. The sound of her machinery through the water got a little louder and then stopped entirely and we guessed that she was resting. Not to be fooled we stuck right to our posts another five hours but there was nary a sound from her.

Then the lookout in the crow's-nest telephoned down that he had sighted the periscope of a U-boat. Did you ever see a field of race horses just before the signal was given them to start? Well, every man-jack of us felt just as high strung and spirited only we didn't show it. The commander ordered me to signal all the other U-boat chasers of our squadron to join us.

The U-boat had come to the surface so that her captain could take a look around and see if there was a ship in sight that was worth sinking. Seeing nothing but our little boat the U-boat

came *awash*, that is her conning tower projected above the water and her deck was just level with the surface of the sea. The captain of the U-boat was evidently observing us through a port from the inside of the conning tower and seeing that our guns were manned and that we were making for her at full speed he had ordered her guns to be brought into action. Each gun was mounted on her deck in a gun-well and was hoisted into place together with its gunner by a plunger worked by compressed air.

We closed in on her and then the shells began to fly. A high sea was running so that it was well nigh impossible for her gunners to hit us or for ours to hit her, but soon a shell, bad luck to it, carried away one of our masts and my aerial with it. I rushed up on deck and there I saw eight or ten of our little chasers heading for the U-boat, which was the *U-53*, the largest submarine that Germany had turned out with the exception of the *Deutschland*.

As each chaser came up the fight got hotter but the U-boat stayed in the game until her captain saw our destroyer coming and then he concluded it was time to submerge her. We



"A BRIGHT FLASH OF BLUE FIRE SHOT UP THROUGH THE
HOLE"—Page 189

knew her captain had given the order to his wheelsman to make her dive for her guns and gunners began to disappear in the deck-wells and in a few seconds the covers closed down on the latter water-tight. Her hatches were closed and her engines, which had been started, propelled her slowly through the water which must be done to make her dive at the proper angle.

Just as her bow submerged Bill put over a shell with a *bow trajectory*, that is, he aimed his gun so that when he fired the projectile shot high into the air and seemed as if it would go far over the U-boat. But Bill knew what he was doing and the shell fell squarely on the U-boat's deck just aft her conning tower.

Having found the range he planted three more shells on her with marvelous accuracy; the last one went through her bow and must have exploded in her torpedo room for a bright flash of blue fire shot up through the hole for fifty feet and this was followed by a dense greenish smoke that rolled out as though she was a blast furnace.

After a couple of misses Bill landed another shell on her stern and this one ripped an awful hole in her; the water poured into her and

amid a series of explosions that threw steaming water into the air like young geysers, with much sizzling and hissing she went down stern-end on never to rise again.

A great hurrah went up from all hands on our boat and our Commander commended Bill on his excellent shots.

"Three cheers for big Bill," I shouted and the gobs responded with mighty lung-power.

"That's the way to swat 'em, eh, matey?" remarked Bill with grisly joy as we were cleaning away the wreckage.

"I say it is, Bill," I made reply.

CHAPTER X

A SIGNALMAN ON A SUBMARINE

DON'T think for a moment that Germany was the only country that had a fleet of submarines. The reason that her U-boats came to be so well known was because they had torpedoed the *Lusitania* and sunk helpless ships right and left no matter who was on them or what they carried.

England and France had fleets of submarines, too, but as their warships had blockaded Germany's ports there was nothing to torpedo. And when we declared war on the Kaiser, Uncle Sam began to build submarines just as he did chasers, merchant ships and everything else. Except airplanes, did you say? There was no such fizzle made of building submarines as for a time was made of building airplanes in the beginning of the war. Within a short time after we got started our Navy Department was able to turn out a brand-new submarine every

two weeks. Think of it! Once the kind and the size of the submarine we needed had been agreed upon by our naval experts, that is, *standardized* as it is called, machines and jigs were made by which each part was stamped out of a solid sheet of metal, and this was done, not in one or a dozen factories, but in hundreds of factories scattered all over the country and each of which made a single part.

These parts were shipped to docks at various ports on the Atlantic seaboard and there artificers of all kinds were ready to assemble them, that is, to put them together. Thus it was that in two weeks after the ore was mined it was made into parts, assembled and the submarine was ready for its perilous cruise.

While the building of submarines was thus speeded up there was another factor that made for their efficiency as a destructive engine of war which was just as important as the boats themselves and that was the crews to man them. Aye, and there was the rub, for a crew could not be trained for this highly specialized work in less than two months' time and sometimes it took three or four months.

Because the submarine job was considered

an extra-hazardous one, volunteers were called for to man the boats and as an inducement for bluejackets to do so a good *bonus*, that is, extra pay was offered. Now Bill Adams knew all about submarines, as I think I told you before, for he had worked for the *Holland Submarine Boat Company* long before the world-war started.

“Let’s me and you go to it, matey,” he said, in one of his bursts of patriotism; “it isn’t quite as soft a snap as we’ve got on this here chaser but we gets more time ashore and then we helps our Uncle Sammy. Besides I’ve made up me mind to buy me mother a flivver; all the washladies in our neighborhood is ridin’ to and from work in them baby land-tanks of Mr. Ford’s, and I guess what they can do she can do, eh, matey?”

“Why not?” I allowed. “She’s got a better right to ride in a motor car than a lot of those high-falutin’ women who live in glass conning towers on Fifth Avenue and never had a son to fight for Uncle Sam. They take everything and they give nothing.”

“Well, I wouldn’t quite say that, matey,” Bill answered thinking hard within the limits

of his ability; "I used to be a kind of anarchist myself, I guess, as I always felt as how I'd like to throw a bomb—no, not a bum—into some of them swell places, but I've got all over it. Why? Because if it wasn't for them big bugs, them rich Janes, there wouldn't be any *Red Cross*, see? Every last one of 'em that is over eight and under eighty is handin' out the coin, givin' the glad hand and workin' like gobs holystonin' the decks and scrapin' cable for us guys what's in the navy and army. But I'm askin' you, as man to man, matey, will you volunteer with me for submarine duty?"

"I'm willing to try anything once, Bill, and I'll take a chance with you on this submarine deal," I told him.

So Bill and I signed up for submarine service and after the crew to which we belonged had had intensive training for several weeks we were assigned to the *H-24* and we went down to Newport to man her. There the first time I saw her she was swinging from a crane high in the air for this was the way they launch these sea babies. She was simply lifted bodily from the dock where she was assembled, swung over the water and gently deposited on the surface.

It was a good thing that I had had experience on a submarine chaser for the quarters of this submarine were so small I couldn't for the life of me see how her complement of men, of whom there were 36, including officers and seamen, could get into the boat, much less live and do their work. I suffered a good deal at first because when we were all inside her there wasn't anywhere to go, not even out, when she was submerged. In fact I felt very much as though I was riding in the drawing room of a Pullman, or locked up in jail, which is about the same thing.

As when we were on the chaser, I was the wireless man and Bill was the gunner whose business it was to work the rapid fire gun on deck. Bill didn't mind being in the close quarters of the submarine at all and I took it that he must have been one of those kids who thought it great fun to snake his way through a fifteen foot length of gas-pipe main that was just big enough around to let his body pass providing he didn't get stuck.

Do you know I always thought I was a sailor until I went on my first cruise in that submarine. But no, I'm no sailor and you can take

it from me there were precious few of the others of our crew besides the commanding officer and Bill who were sure-enough tars of the old Neptune stripe. I'll bet you a dollar to a glass of grape-juice that of the thirty-six men on board—or shall I say *in* board—thirty of them were sea-sick. Of all the rolling and pitching a boat ever did I'll give the cake to *H-24*.

Not only that but when we were running *light*, that is when she was as high out of the water as she could get with all the water out of her ballast tanks, and we had rough weather I had to strap myself in my chair to keep from being thrown around the room. As one of the torpedo men used to sing, "Mr. Captain, stop the ship I want to get out and walk," and, indeed, I would have given my pay and the bonus to boot to have had my old job back again on the chaser. It was all Bill's fault and I didn't mind telling him so either.

"I should worry, matey," he would say, and that's all the satisfaction I could get out of him.

After the *rookies* got over being seasick we went out on practise trips when each man was taught all about the machinery and how to

work it. This was done so that in case a man was put out of action another could take his place. It didn't take me very long to get *hep* to all the tricks for I already knew the A B C of oil engines, which again came in handy; storage batteries were right in my line and the rest of the machinery was pie for me.

The *H-24* has a hull that is very much like a huge catfish, that is it has a blunt round head and the torpedo tubes, one on either side, look for all the world like a pair of great eyes; the body tapers off gracefully to a point at the tail and on this the direction rudder is attached. Two horizontal rudders, or *hydroplanes* as they are called, by which the submarine is given its diving angle, are fastened one to each side of her head and give the appearance of a pair of great lateral fins.

Her hull is built up of thin but exceedingly strong sheets of steel and these are riveted together in the same fashion as the hull of any steel ship. When you consider that the hull of a submarine must be able to stand a pressure of at least 200 pounds to the square inch—as much as a high pressure steam boiler—without collapsing when it is fully submerged it must

be clear that the strongest steel plate which can be made must be used.

A steel deck, or superstructure as it is called, covers the top of the hull from bow to stern, nearly, and on its middle sets the *conning tower*. A steering wheel and compass are fixed to the side of the conning tower so that the boat can be steered from the outside when she is running light or awash.

A short mast, called a *stanchion*, is also fixed to the conning tower and this carries the signal lights and holds one end of the aerial, the other end being fastened to the stern. It isn't much of an aerial but as our submarine was built for coast patrol cruising we were never very far from shore.

The inside of the hull is partitioned off into rooms, or compartments, and these can be shut off from each other by means of bulkhead doors and so made watertight. The purpose of these watertight compartments is to prevent the water from filling the whole boat if she should be unlucky enough to be hit by a shell or rammed by a ship. To my way of thinking watertight compartments seem to be of little use whether the boat be a submarine or the

largest ship. For instance when the *Titanic* was scrapped by an iceberg and the *Lusitania* was hit by a U-boat torpedo they both went down in a few minutes.

I won't try to tell you what all the different compartments have in them but some of them are most uncommonly interesting and these you should know about. The first is the conning tower with its *periscope*. When the submarine is running either light or awash and the weather is good the commander can see what's what around him from the deck or from the *bridge*, as we call the top of the conning tower. When the weather is rough or an enemy is nigh he takes a look around through the ports, that is, watertight windows, in the conning tower.

Should, however, the boat be submerged and the captain wants to size up the situation he permits only the top of her periscope to project out of the water and through this he scans the sea. Whenever I got a chance I used to look through the periscope. At first it was hard for me to make out a vessel on the surface because the field of view was small and what with the boat rolling from port to starboard it seemed to me I was always looking at the water

or the sky; but after awhile I got so I could take in whatever there was to see in between times.

Our submarine had two periscopes, one of the older kind that you have to turn around in order to see the whole horizon, and the other, which was the latest style, showed the whole horizon at once with a magnified view of the ship or other vessel in the distance in the center. This scheme was a great invention as it prevented us from being attacked from behind unawares. It was like having a third eye in the back of your head.

Inside the conning tower are also speaking tubes and an electric system of lights and bells worked by pushbuttons and these run into all the compartments; by means of these intelligence transmission systems our captain could get in touch instantly with the chiefs of the crew in the engine, diving, torpedo and wireless rooms.

There are also several instruments in the conning tower and among these is a *depth meter*, that is, a device that shows just how far below the surface of the water the boat is. An *inclinometer* which points out the angle at which the diving rudder, or hydroplane is set, and a

tell-tale, that is a bank of miniature lamps, each of which is connected to a detector in a compartment. Now if the boat should spring a leak the detector closes the current and the lamp is lit.

Then there is another electrical system that closes all the bulkhead doors by electricity. The instant the tell-tale lamp lights up and shows that a compartment is leaking the commander presses a button which rings a bell in it and this warns any of the crew who may happen to be in it to get out; by throwing a switch the current operating the motors which work the bulkhead door is cut in and the door is screwed down watertight. Should a shell put the conning tower out of commission the boat can still be steered from the navigating room in her hull.

The power plant that drove the *H-24* was a big 12-cylinder oil burning engine that developed, I should say, about 3,000 horse-power and it worked on the same general plan as a motor car engine. Now when the boat runs light or awash the engine drives her propeller direct and at the same time the engine runs a dynamo and this charges a large storage battery.

But when the boat is running submerged the engine has to be shut down because the burnt gases cannot exhaust into the water as the pressure of the latter is too great. A powerful electric motor is coupled to the propeller shaft and this is energized by the current from the storage battery.

The ballast tanks into and from which water is pumped to make the boat sink and rise is in the middle of the bottom of the hull. The torpedo room is for'ard in the bow of the boat, our sleeping quarters aft of this and my wireless room lay between our sleeping quarters and the navigating room.

While life on the submarine was not exactly what you would call a pleasure bout still we were all keyed up to the point where we wanted to get in our fine work on the *boches*. Finally the time came when we received orders to move and while only the officers knew where to or for what purpose at the time of departure we were all let into the secret after we had got under way.

At the beginning of the war the Germans had vessels of various sizes in all parts of the world. Those that were in our ports were interned

while some of the smaller ones that were at sea became pirate ships, technically known as *raiders*. They flew the flag of Germany when it suited them to do so but they hoisted any flag that would best help out their diabolical plans.

These raiders scoured the seven seas and whenever they ran across an unarmed merchant ship bound for any port of the Allies they promptly shelled and sunk her and, more often than not, without giving the ill-fated crew enough time to take to the life boats. As Bill Adams used to say, "I calls it murder."

Of course if the raiders could have taken their prizes to their own ports they would gladly have done so for Germany sorely needed whatever cargoes they carried, but the raiders could not do this for the Allies had blockaded every port of the Central Powers. This being true the next best thing to do from the German point of view was to sink the ship and drown the crew.

There were two or three of these German raiders steaming up and down our Atlantic coast and they operated a few hundred miles off shore and out of the beaten paths. It seemed likely that they worked, part of the time

at least, in conjunction with U-boats for whenever a ship went forth armed a torpedo sank her but if she was unarmed the raider's guns sent her to the bottom.

Uncle Sam was getting mighty tired of this sort of business and so he hatched up a little scheme. A small steamer, the *Henrietta*, was fitted out without guns, painted a sea-gray and flew the stars and stripes when she was sent to sea. Our submarine was sent with her, not exactly as a convoy for she was not sailing for any overseas port but instead she was sent out simply as a decoy.

We followed her at a distance of about a mile and as long as there were no other ships in sight we ran light, though the way the waves broke over her she seemed to be running awash most of the time. This made no difference to us and it was a great relief to come up from our stuffy holes and walk the deck. Of all my sea-going experiences I liked this much the best.

Why? You know how a city chap with a drop of red blood in his veins likes to get out in the woods and walk, eat and sleep on the ground. He does it simply because he gets as close to nature as he ever can and know about it. Well,

when I walked the bit of deck of the *H-24* I got just as close to the sea as I could and yet stay above water and there was a mighty fascination about it too.

We cruised about most of the time in a light condition, though we occasionally had to submerge and tagged around after the *Henrietta* which acted as a base, or mother-ship to us. It was a curious thing how merchant ships that made every effort to keep out of the way of raiders would run right into them and that the *Henrietta* who was out for this very purpose couldn't meet up with anything more dangerous than a sea-gull.

But hold, matey, what's that the Captain of the *Henrietta* sends over by wireless? We can't see the ship for we set too close to the water but he can make it out very well with his glasses. We dive until we are completely submerged but still following in the wake of the *Henrietta* according to a prearranged scheme.

"Ship headed for us," the *Henrietta's* Captain signaled our Commander by our sound conduction system.

"She flies the French flag," he sent to us next.

Then later on I got this and handed it to our commander:

“Believe she’s a German raider.”

Every man was at his post and ready and anxious to do his duty. When the raider, which was the *Koln* and one of the worst offenders of her kind, was within half-a-mile of the *Henrietta* she sent a shot over her bow and signaled her to *stand by*. This she did and then the Captain of the *Koln* signaled that he would send his officers to examine her papers and cargo—to get whatever gold she might have—and this he promptly did. At the same time he had her guns trained on the helpless *Henrietta* to prevent her from trying to steam away or putting on all speed and ramming her with her sharp bow.

Just as the officers of the *Koln* were being lowered in a launch the Captain of the *Henrietta* signaled our commander just two words and these were: “Torpedo her.”

We came to the surface about a thousand feet from and on the port side of the *Koln* and took her completely by surprise. Her gunners began blazing away at us but they had evidently not been trained in the gentle art of



OUR TORPEDO PASSED THROUGH THE RAIDER'S HULL AND
EXPLODED INSIDE—Page 207

swatting submarines for the trajectory of their shells was way too flat, that is it was not curved enough and with, possibly, two exceptions they struck the water and instead of sinking they *ricocheted*, that is they were thrown from it again on the same principle that a flat stone skips along on the water when you throw it nearly parallel to its surface.

Bill was right there with his semi-automatic and dropped a couple of shells on the deck of the *Koln*. In less time than it takes to tell it to you our commander had swung our submarine round so that one of her torpedo tubes was pointed directly at the *Koln* and gave the signal to the officer of the torpedo crew to shoot the torpedo. He turned on the compressed air which drives the torpedo from its tube and it shot out and into the sea. We watched it with all eyes as it traveled like a blue streak under its own power below the surface and dead on for the broadside of the *Koln*.

The German crew saw the white trail it left behind and they must have become panic-stricken for some of them jumped overboard, others manned the lifeboats and bungled the job so that two of the boats capsized before

they ever touched the water. In less than a minute the torpedo struck the hull amidships, passed through it to the inside and exploded with a terrific report.

It looked to me as if the whole ship was thrown bodily out of the water by the sheer force of the explosion and then parted in her middle. As she settled down on the water a great black cloud of smoke poured out of her hold and when the air struck her she caught fire and was soon a solid, seething sheet of flame. It was the most magnificent spectacle I have ever seen from longitude 0 to 70 degrees west of Greenwich and from the Equator to the Pole.

Different from the German idea of *kultur*, instead of letting the crew of the *Koln* drown, the Captain of the *Henrietta* sent out boats and stood by until all of them were picked up and on board his ship.

We then sailed back to our naval base where the German crew was taken off and interned in a concentration camp until the war ended. Their fighting days were over while on the other hand mine had just commenced.

CHAPTER XI

WITH THE FIELD ARTILLERY IN FRANCE

THE strain from being cooped up in the small and stuffy quarters of the *H-24* was beginning to tell on me and the blind way in which we had to manœuver did not make me care for the life so I bethought me it would be a nice change to get into the flying game.

Moreover my arm had begun to pain me considerably at times and so I determined to get a disability discharge. This was not a hard thing to do for any one with a heart need not be told that a man with a game arm should not be made to continue in active service if he didn't want to.

Consequently in February I received my discharge and after seeing my folks I concluded it would be best to have my arm operated on to remove the stiffness. This I did and after the plaster casts that had been around it for a month were removed I was once again the

owner of two good, strong, healthy arms and in every way fit for service of any kind should I care to enlist again.

To get a commission as a lieutenant in the Flying Corps was not as easy as I thought it would be and I found the whole machinery of making an application so clogged with red-tape that the farthest I was able to get was to satisfy the insatiable curiosity of military authorities as to everything pertaining to myself, parents and even down to the dimensions of my great grandmother's left ankle. I was simply out of luck!

The more I thought about it, though, the more I was determined to get to France where the *big game* was going on. So one bright May morning I went down to a recruiting station at 42nd Street and 6th Avenue, New York, with an entirely original idea and that was to enlist in the cavalry. I picked the cavalry because I thought the outdoor life would help to build me up and that riding a horse would not make my feet as sore as marching.

While I could have enlisted in the *Signal Corps* as a wireless operator I believed my chances for seeing red blooded life overseas

were better if I joined one of the common or line branches of the service. Having eaten a salt mackerel for breakfast and washed it down with a bucket of water (I was a little underweight) I went down to the recruiting station. In a crowded downstairs room filled with a crew of other fellows waiting to enlist I filled out a card giving my age, residence and consent to be enlisted should I pass the physical examination which was held every couple of hours.

We were stripped of our clothes, lined up in a row and one by one we were examined by the recruiting officer who put us through eye, foot, breathing and other like tests. I had hard work to keep my *game* arm from failing me but I came through all right. Finally I was weighed in, cautioned against the extreme penalties of lying and then asked all about my past life. The officer in charge of the station was next called in and gave each of us a little physical inspection of his own, with the result that he threw out a few of the candidates as being unfit. Sixteen had been accepted and—oh, joy—I was one of them.

This done we dressed, signed a register which

showed we had been accepted, were given *sealed orders* and transportation and told to report to Fort Slocum, on New York Harbor. After a long ride on the subway, trolley and government ferry I arrived at Fort Slocum. It is located on an island in the harbor and is formed chiefly of houses for the officers, regular barracks for the infantrymen, or *doughboys* as they are called, who are stationed there all the time, and a lot of wooden shacks and tents for the recruits who come in.

The examination I was given at the recruiting station wasn't a marker to that which I received at Fort Slocum and as a result it was not until the night of the day after I got there that I was sworn in and duly became a recruit in the cavalry of the United States Army.

I stayed at Fort Slocum for the better part of two weeks waiting patiently for the time when I should hear my name called among the others of the daily outgoing list, and be one of the recruits to go away to be trained. I had hoped to be sent to Texas for my training but when at last I was on the outbound list it was for Fort D. A. Russell, Wyoming.

After a four-day ride on a troop train we

arrived at Fort Russell which is about three miles from Cheyenne. There our cars were switched onto a siding and we landed just as the sun was setting in the golden west. And say, man, as far as the eye could reach except in one direction, where there were mountains, the land was as level as the sea in a doldrum. Oh, why, oh, why, did I ever leave my happy berth on the *H-24*?

Up to the time of our arrival the Fort had not been occupied except by the officers and a few old service men from the Mexican border who were to act as non-commissioned officers while we were being trained. A few of the officers were at the post station and we—there were about 200 all told—were marched over to headquarters where the troop commanders were waiting for us.

Teamsters, horseshoers, clerks and recruits having other trades of a useful kind were picked from the bunch and assigned to troops. If I had wanted to I could have been a troop-clerk which carries with it a Corporal's warrant but since I had enlisted I made up my mind to go in as a common trooper and get my share of riding and my fill of drilling—both of which I did

—like the rest of them. So it came about I was assigned to *M Troop, 315th Cavalry, U. S. A.*

Now Wyoming is different from the Amazon country in that there are no trees and the ground is covered with short, sunburned buffalo grass. From the post I could see the Rocky Mountains a hundred miles away and from this you may conclude that after Nature got tired of making all the other countries she made Wyoming—but not so, for Arizona came after.

To make up for whatever the scenery may have lacked the post was a marvel and neither money nor labor had been spared to make it comfortable. I've been in apartment houses on Riverside Drive that couldn't hold a candle to it. There were large two story brick barracks with big squad rooms where we bunked and a big mess hall where we ate. In front of the barracks was the drill ground and there for an hour and a half every morning we did the *dismounted drill* of the cavalryman and then the rest of the morning was given over to *equestration*, which in every day American means riding.

Our horses were of the genuine western variety and—woe be me—most of them had never

been ridden before except once or twice perhaps, by the wranglers of the remount stations. This being true the eastern recruits spent the best part of the time between the horses' backs, the air and finding a soft place to land. A fellow could lash himself to a stanchion in a submarine but never to the back of a bucking broncho.

Along about this time Cheyenne held its annual *Frontier Day*. This consists of gathering the best riders and ropers from all over the United States who compete for the glory there is in it though not overlooking the big purses offered. All through *Frontier Day*—or week, it should be called—Cheyenne slipped back half a century. The city was filled with booted and spurred cowpunchers from every ranching state in the Union. They wore sombreros and shirts of every color the rainbow affords. Then out at the race track at Frontier Park I saw such feats as squaw races, trick riding and fancy roping; roping, throwing and hog tying a steer in 23 seconds—the world's record—and bull-dogging a steer. I pined for my old pal Bill Adams to see these landlubber stunts.

After four months of drill and riding, pistol

and rifle practise on the target range, in fact just as we were beginning to consider ourselves old cavalrymen, we were given a sudden jolt by being told that no more cavalry would be sent overseas and that we would be changed to light field artillery. Now there are a couple of lines in an old army song that run like this:

“The Infantry for bravery,
The Artillery for slavery.”

We were a badly disappointed crew, but a good soldier is one who obeys orders no matter how tough they are and we were good soldiers. In due course of time we were shipped to West Point, Kentucky, where we were to receive our artillery training in seventy-two days and then go overseas.

Because I had been a wireless, or *radio*, operator as it is now more often called, and because wireless is an important part of artillery I was immediately picked to go to the radio-school. I laughed at the idea of my going to radio-school. What's the use when I am already an expert operator and had been in the Navy? But I found out there were still a few things I could learn about wireless.

In the artillery the *eyes* of the army, which is the aviation section, provides the artillery with airplane and balloon service and in order to co-operate successfully with them the wireless operator must have a special training. For three weeks or so we did nothing but *buzzer* practise; that is a buzzer, which is an electric bell without the bell, is connected in circuit with a battery, a telegraph key and some twenty head-phones. The beginners put on the receivers and an instructor worked the key.

As I could easily take twenty words a minute I was made an instructor. Then there were lectures on the elements of electricity and magnetism and by the end of the first month the class was ready for the fundamentals of wireless telegraphy. All of that was old stuff for me and as they say in the army it was *pickin's*.

The time came when we were introduced to the real wireless apparatus and although the sets were portable and of shorter range than any I had handled since I was a kid operator they were certainly beauties. There were three different types of wireless sets; each one was designed to cover a certain distance, and each sending set had its special receiving set.

The range of the smallest set was about a mile, while that of the largest was about twenty-five miles. These are very short ranges but enough for army purposes where messages are sent from the trenches through one operator after another or relayed until they reach headquarters.

As I said before the purpose of the wireless stations is to cooperate with airplanes and balloons and aid in the control of artillery fire. So in the months that followed our work was to go out on the firing range with the batteries and to cooperate with the airplanes and balloons.

I had been warranted as Corporal in charge of the *2nd Battalion Radio Detail*. You know, I suppose, that a regiment consists of two battalions, each battalion of three batteries, each battery of four guns and the complement of about 200 odd men necessary for their action. So my detail was responsible for coordinating the *eyes*, that is the airplanes and balloons of the three batteries in the second battalion, with the guns.

Possibly you may wonder why it is necessary for airplanes to work with the batteries and

here is the answer: the guns, or *pieces* as they are called, were American 75's, that is, the bore of the gun is 75 millimeters in diameter, and as the range they are fired over is seldom less than two miles some one must *spot* the fire, that is see just where the shells hit around the target and then tell the gun crew so that they can point their guns more accurately, all of which is called *directing the fire*.

Now an airplane can do this to perfection but there must be some kind of communication established between it and the battery, and this is where we came in with our wireless. I had five men in my detail, there being two operators and three *panelmen* and of the latter and their work I will tell you later.

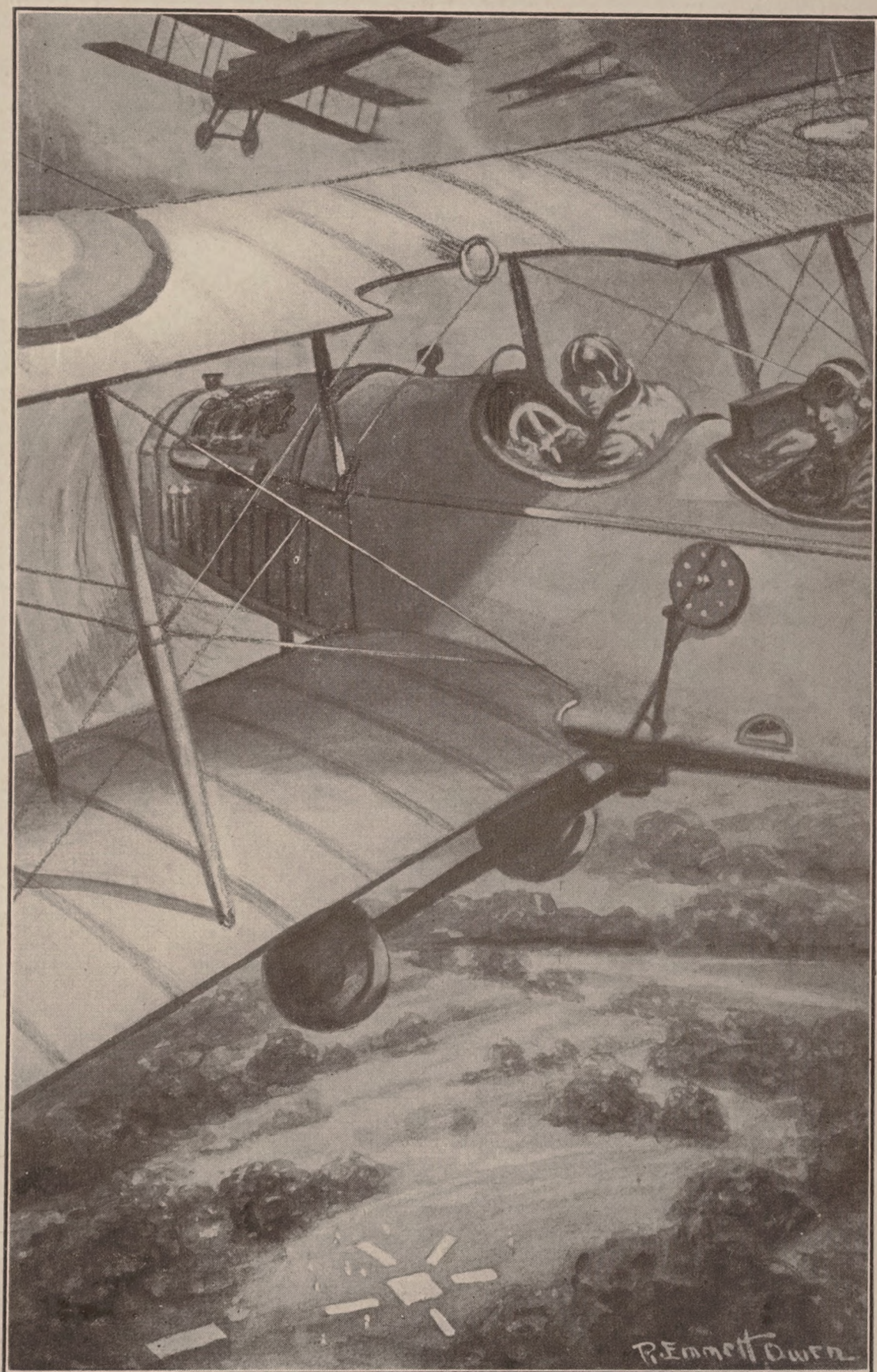
Our regular performance each day was like this: The batteries would go out to the range in the morning, place their guns and set up their B. C. stations, that is, *Battery Commander* stations where the Battery Commander would be located within a few feet of the pieces to work out any problems that might arise in aiming them.

With the detail and accompanied by a second lieutenant, who was the officer in charge, we

would arrive at the range a few minutes before one o'clock which was the time the batteries were scheduled to fire. The operators and the panelmen would get busy setting up the aerial wire system. This consisted of two jointed masts about fifteen feet high and each one of which was made in five sections.

The masts would be set up about a hundred yards apart and a single aerial wire was stretched between them. The leading-in wire was then connected to a receiving set and the latter to the *ground*. This was formed of a pair of wires stretched on the ground directly under the aerial wire and to each of their free ends a copper mat was fixed with a little dirt thrown over it.

The whole equipment is so built that we used to set it up ready for work in from three to five minutes. The operators then adjusted their head-phones and were ready to *tune-in* the incoming signals from the airplane as soon as it should come in sight. You see, our detail on the ground only received wireless signals from the airplane while the operator in it, or *observer* as he is called, only sent wireless signals. This one sided arrangement had to be used because



"THE AIRPLANE SIGNALLED DOWN TO US IN CODE"—Page 221

the propeller makes so much noise that the operator in the airplane would have trouble in reading the signals. In order to signal to the airplane as she flew above us we used a system of *panels*.

This consists of a large piece of white cloth about twelve feet square spread out on the ground and three strips of white cloth twelve feet long and a couple of feet wide. These strips are laid in different positions relative to the square and each position has a number that means an order which the observer in the airplane also knows.

Further a small black square about eighteen inches on the side is placed on the big white square so that the observer can tell which battalion the outfit belongs to. The different positions of the strips and square are given numbers and the panelmen as well as the observer know what order each number means. As the panels can be arranged in twenty-seven different positions it is just about as hard to learn the panel code as it is the Morse alphabet.

Now as soon as the wireless apparatus has been set up the panelmen put out their big square and one strip at the end of it, and when

the airplane comes close enough to see the panels he knows that we want him to *designate*, that is to name the target which the battery is to fire at. This he sends to us by wireless and our operators write it down.

While our detail was setting up the wireless apparatus, the *telephone detail* from our outfit had run a *wire line* from our B. C. station to the batteries which are several hundred yards ahead of us. When our operators get the target, or *pin-point* as it is called, from the observer in the airplane, he (the operator) phones it to the battery commander who orders the guns set for it.

The airplane then signals down to us in code and asks "is the battery ready?" The telephone man tells us that the battery is ready and the panelmen put out No. 5, which means "the battery is ready." The airplane observer sends down "*fire*," our operators yell the order to the telephone man who in turn shouts it into the mouthpiece of his 'phone; the 'phone operator at the battery end informs the Battery Commander and he gives the order when the guns are fired either by *piece*, that is one at a time, or by *salvo*, which is all at once.

We immediately put out No. 8 panels which mean that "the battery has fired." Shrapnel is used during these trial shots as the observer in the airplane can easily see by the bursts just how far or close they come to the target and this is what he does. After having seen where the shots landed the observer flies back over our station and signals down to us the number of yards to the right or left of the target and *short* or *over* the shots landed.

The telephone man sends this to his Battery Commander, who computes the necessary correction in aiming the gun, and the performance of signaling and firing is repeated until every shot becomes a *target*, that is, hits squarely on the mark.

At intervals of half-an-hour the balloon station, that is, the captive balloon, sends out *meteorological data*, which means weather reports, chief of which are the barometer readings, by wireless and this we get and transmit to the B. C. station by telephone. At 4 P. M. the batteries cease firing, we take down and pack up our station and go back to camp.

As I have said we repeated this performance for a month until we were letter perfect in co-

operating with the airplanes. And then one morning almost without a word of warning we were told to pack up our personal equipment. We turned over the wireless apparatus to the supply officer of the company and by evening we were on our way to Camp Mead, Maryland, which was one of the ports of embarkation for overseas men. We spent ten glorious days at Camp Mead without a tap of work to do.

On the morning of the eleventh day we boarded a big three stack troop-ship, weighed anchor and by noon we were off for France. To most of the men aboard, many of whom had never seen the ocean before, and some of them were never to see it after, the voyage was a great joy or a big sorrow according to the states of their stomachs, but to me it was a long and tiresome trip. The ship had been altered from a floating palace into a purveyance which would carry the greatest number of men it was possible to crowd into her.

On the morning of the eighth day after we had embarked we landed at Liverpool and were given a royal reception by the enthusiastic Britons. The way they warmed up to us was a revelation to me for I had no more idea that an

Englishman could change his attitude toward an American than that a jaguar could change his spots. The miracle had come to pass nevertheless.

From Liverpool we went on to London riding in first class compartment coaches as if we owned the railroad. We were in Lunnon, old dear, for a week in which time we paraded, and were dined and petted as if each man-jack of the whole bloomin' outfit was a Beau Brummel, a Count D'Orsay, a Lord Byron, or some other dandy of a century before. I forgot entirely that a world-war was going on across the Channel and that we were over there to fight monsters of the kind that bayoneted babies, instead of living like dukes.

Then one night we were slipped in darkness from Folkestone across the English Channel to Calais. If the joy of the British in seeing us two thousand strong was great it wasn't a marker to that of the French who cheered us as we marched through the streets of Paris, and later when the batteries had been dismissed they opened their arms to us—especially the *demoiselles*. Talk about *morale*, why I could have licked a dozen *boches* with my left arm tied

back of me. That was the kind of fighting men the Hindenburg line had to go up against.

A couple of weeks later we were joined by our 75's and horses which had been shipped across on a different boat. From that time on we moved by forced marches until we were only twenty miles back of the fighting line. For a month we were held in reserve and each day we would go out, as did numberless other batteries, set up our station and work with our airplane as we had done at West Point.

We were getting pretty tired of it for we wanted to see action and there right ahead of us was the big adventure where there was action a-plenty. At last one day came the call we had looked forward to so long and we marched under cover of the night to our position somewhere between the Argonne foothills and Château Thierry.

When daylight broke a most amazing sight spread out before us for there was a string of 75's stretching on either side of our battery as far as the eye could reach and forming an almost solid wall. There was no trench fighting going on here, just open warfare between artillery, that's all.



"BUT FOR EVERY ONE THE BOCHES SENT WE PUT OVER TWO
OR THREE"—Page 226



The registering of the batteries was guessed at so that the enemy would be taken by surprise and he was. The command to fire was given and we let go a howling hurricane of shells that deluged the enemy. The German guns rallied to meet our attack and from that time on a royal artillery duel was on. Once under cover of a heavy *barrage* their shock troops came on only to be mowed down by us at point blank range.

Talk about fire and brimstone of the infernal regions, it is a feeble place of punishment as against the hades let loose in our sector that morning. Shells were screaming through the air and bursting all around us but for every one the boches sent we put over two or three. Our men were dropping but we kept the guns going as if they were fed and fired by machinery.

A shell had put our wireless equipment out of action, killed a couple of our men, wounded a couple more and stunned me for a few minutes. When I came to I went over to the battery and was giving the gunners a hand. Planes were darting back and forth over us and every little while terrific battles took place

between our fliers and the *boches* for the supremacy of the air. Suddenly I saw the airplane attached to our battery fighting half a dozen enemy planes, which was often the case for the Germans had four or five times as many airplanes as we had at that time.

Our airplane had caught on fire and she fell within 300 yards of our lines. I saw one of our airmen crawl from her and then fall over on the ground. I crept out in a rain of bursting shells to where our machine lay and managed to extricate Flight Lieutenant Ross from the debris and as good luck would have it he was not much hurt. Then I lifted Observer Gilfillan onto my back and we started for our line. When we were within a hundred feet of it a sliver from an exploding shell struck me in the leg and shivered it. I crawled back and another man brought Gilfillan the rest of the way. After being treated at the field hospital we were removed to the base hospital where I was decorated. Soon after I was sent to Paris and since it was clear I could no longer be of service I was returned home and discharged, and—here I am. That's the thumb-nail sketch of how I did my bit for Uncle Sam.

CHAPTER XII

MUSTERED OUT

JACK HEATON and I had just finished our goulash at Moquin's on Sixth Avenue (New York), and the waiter, under the stimulus of a piece of money, graciously removed the table cloth as he had been asked to do on twelve previous occasions.

I took a couple of quires of blank paper out of my brief case and laid them in front of me; then I produced a pair of fountain pens, one filled with black ink and the other with red ink, the latter for writing on chapter headings and putting in such corrections as might be necessary, and all of which showed without any deduction that I was in for a writing spell.

“Well, Jack, we've got down to the last chapter and this sitting will finish it,” I started off encouragingly.

“I've told you all my experiences and if there's any more to be said I guess you'll have

to say it, Mr. Collins," remarked the bored young soldier.

"No, my boy," I said firmly, "there are still some outstanding features about wireless I want to talk over with you, and besides I have never turned in a script to my publishers that had less than twelve chapters, that is, except a shortcut arithmetic and the shorter a book of that kind is the better."

"I don't know of any outstanding features as you call them; it seems to me I've told you everything that ever happened to me. What else can I say?" protested the young man.

"Give me your version of how we met, tell how you looked in that natty overseas uniform, how I looked, what is on your mind now and all that sort of thing. Then we'll discuss the wireless transmission of power, wireless airships and submarines, talking to Mars and finally about the diamond fields of South America for I'm as interested in them as your friend Bill Adams," I suggested.

Jack laughed.

"Why, if I painted a word picture of you I'm afraid you and I'd part company."

"Hardly, my boy, hardly," I reassured him.

“I’ve gone through war, or what war is; I’ve licked a couple of would-be Kaisers myself and I’m going after a few more of them before I have done with life. I am, forsooth, a bit battle scarred but my skin is as thick as that of a rhinoceros. Any little thing that you might say about me I’d be delighted to jot it down.”

“Let’s see,” reflected Jack, “when we left off yesterday I had just been discharged from the hospital and was back with my folks in Montclair. When I was able to get around I wanted to see Broadway and came over one morning with dad. I was feeling bully as I was strolling down the trail when suddenly I spied a man I once knew although I hadn’t seen him in years, no, not since I was a kid operator learning wireless.

“He was a tall, spare man like yourself, whose legs, as honest Abe once said, were long enough to reach to the ground. He might have been anywhere up to a hundred and five, by which I mean his age and not his weight; at any rate he had surely seen fifty summers and heaven only knows how many hard falls.

“He was slightly stoop-shouldered, which I suspect was due to his sticking to his desk too

closely, or, perchance, because he couldn't shake the weight of his own tragedies from them. His face was pale, quiet and cadaverous, but whatever troubles he may have had and however many, they seemed not to have attacked his hair for it was all there, nearly,—though I didn't count 'em—with not a gray one to mar their beautiful mouse-like color. In truth, he dressed like you, looked like you and, by gravy, he *was* you, Mr. Collins."

Jack laughed heartily at this photo-impression of his old friend and I was glad to know that after all he had gone through with here, there and everywhere and the pain he had suffered and was suffering even then, he was still able to see the humor in so grisly a subject. I laughed, too, just to show him that I had not yet given up the ship and, hence, there was still hope for us both.

"Turn about is fair play and now that you have given a word picture of me I'll give one of you. As I remember our meeting it was like this: I was hurrying up Broadway one morning when suddenly a young soldier stepped abruptly in front of me thereby barring any farther progress on my part. I observed he

had a trim fighting figure and wore the uniform we love so well. He wore puttees and limped somewhat but from the medals he wore on his breast I judged that he had met the enemy and that they were his—and ours.

“His was a fine, heroic face and the very way his over-seas cap set on the side of his head, his smiling eyes, his hearty laugh and the firm, smooth grasp of his hand was enough to show me that he was one of the brave boys from over there who had caught ‘the torch from failing hands and held it high in Flanders fields.’

“ ‘Don’t you remember me, Mr. Collins?’ he cried. ‘I’m Jack Heaton, and you used to let me make things in your laboratory over in Newark when I was a kid!’

“ ‘Of course I remember you but, my, how you have grown. I never would have known you. You were rather a frail chap then and now you’re such a powerfully built young fellow.’ And then we talked about you and all your experiences since I last saw you. I told you that you ought to write a book and you said that there wasn’t much to write, and that if it was done I’d have to do it for you.

“ ‘Then we agreed we’d collaborate, you to

furnish the experiences and I to write them out and I wanted to give you whatever was made from the sale of the book and that I would take the glory of having written it for my share of the profits; but you wouldn't have it any other way but that we would divvy fifty-fifty."

"That part was all right," put in Jack, "but what made a hit with me was that you said you knew a publisher who would take the book and forthwith we drew up a provisional table of contents. Then we went over to your publisher; you explained the idea to the editor and gave him the table of contents and we got the contract the next day. And do you know, Mr. Collins, that my leg began to feel better right away!"

"That was some weeks ago, Jack, but I've enjoyed your company so much and have been so interested in what you've told me I wish we had it all to do over again. Well, Jack, we must to work again."

"All right, but before we get busy I want to tell you of a *séance* I once had with King Solomon. Do you believe in spirits—in wireless spirits?"

"Heard of all kinds of wireless and several

kinds of spirits but don't know the breed called *wireless spirits*," I admitted.

"I was introduced to one in London. One evening an operator from one of the Red Star liners who was interested in magic, spiritualism and all that sort of thing, wanted me to go with him to see a performance of Maskelyn and Devant's Mysteries at St. George's Hall in Langham Place, W. C.

"The mysteries of these mystifiers were mystical enough to mystify the most mysterious and I saw everything from the wonderful East Indian rope trick to the equally wonderful spirit rapping table. David Devant, the celebrated conjurer, exhibited the table and he said—and nobody in the audience disputed him—that the table possessed the ghostly property of connecting this world with the next, the quick with the dead, that which is now with that which is to be, and that it would rap out answers to any questions which might be asked to prove it.

"Some of the wiseacres present laughed lightly at the conjurer's immaterial remarks but he assured them on his honor as a gentleman its guiding spirit was no lesser an (astral)

light than that of old King Solomon himself. Thereupon Mr. Devant invited the audience to ply the immortal part of the departed wise man with any questions that might be fit and proper.

“Strangely enough while nobody believed in spirit communications as exemplified by the rapping table everybody was most anxious to ask some question which no one on this side of the borderland could answer. The replies that King Solomon rapped out were deep and philosophical although not always conforming to our ideas of ethics and morals. Indeed, his very first reply to a question, which was put by some guileless suffragette, nearly broke up the show. She asked him, as Bill Adams would say ‘as man to man,’ how many wives a man should have, and in that she thought she had trapped him even though he was beyond the pale of the law. But Solomon showed his superior wisdom as usual and rebuked the lady by rapping furiously on the table until he had nearly eight hundred wives to his credit.

“To convince the audience that the table was just a common, single legged, three footed one of the milliner’s variety the conjurer invited a committee to step up on the stage and examine

it; I went up with several other men and we nearly had a private séance with old Sol. We examined the table and found it O. K.; to me it seemed a little top heavy but I made due allowance for this because King Solomon was a brainy man.

“Now when the conjurer held it at arm’s length, or I did so as one of the committee, it kept right on rapping out replies from the gone but not forgotten spirit of the ancient King. Even when the table was passed through the audience—”

“You mean *among* the audience, don’t you, Jack? Even a spirit table would have hard work passing through the audience.”

“I stand corrected. Even when the table was passed among the audience it kept up its dark rappings to the great enjoyment of the audience. To me the rappings had a more or less mechanical sound as if King Solomon’s knuckles had turned to spirit gold, or common brass would do.

“I figured it out that the raps were done wirelessly, by which I mean that the top of the table was hollow and contained a small but sensitive receiver with a single stroke tapper

and as the top of the table was made of a sheet of burnished copper and the three footed base was of iron with the connecting leg between them of wood it seemed reasonable to suppose that these formed the aerial and ground.

“Although I listened hard I couldn’t hear the faintest sound of a spark-gap working but it is an easy matter to put the transmitter in a sound-proof booth.”

“And thus doth a little science make big skeptics of us all. Now tell our young readers, Jack, how *S O S* came to take the place of *C Q D*, as the ambulance call of the sea.”

“It came about in this way. In 1896 the *International Wireless Telegraph Convention* was held in Berlin. Germany’s wireless men, from her greatest scientists down to her lowly operators hated anything that had to do with or was used by Marconi, so instead of *C Q D*, they suggested that the letters *S O S* be used. Unlike *C Q D*, the letters *S O S* have no especial meaning in themselves but they are easy to send and to read and make, as a matter of fact, a good distress call.

“While *S O S*, was probably sent out many times by various operators from that time on

it did not become famous until the *S. S. Kentucky* went down off the Diamond Shoals. Her operator did as many an operator had done before him and has done since, that is, he kept sending the *S O S* call. Her engine room was rapidly filling with water but before her dynamos were submerged and put out of commission the operator on the *Alamo* of the *Mallory Line*, ninety miles away, heard the call. The *Alamo* reached the sinking ship just in time to save her passengers and crew before she went down."

"Do you think it is possible to send a wireless message around the world?"

"Not without relaying it. You remember back there in 1909 when all the small fry who were following in Marconi's footsteps were trying to do something more wonderful than the great inventor? One of them made the statement that he had sent out a train of electric waves from his high power station which traveled completely round the world and in a small fraction of a second he received the signals on the same aerial; and he was backed up in it by a college professor, too."

"I agree with you that college professors

may sometimes be wrong, indeed they are nearly always so," I assured him.

"Now any kid operator knows," continued Jack, "that electric waves are radiated to every point of the compass around an aerial and hence even if the waves sent out by it had enough power to go around the world they would meet on the opposite side of the earth and neutralize each other.

"What do you think about signaling from the earth to Mars, Mr. Collins?"

"Not very much. It is never safe to predict, especially to make a negative prediction, by which I mean to say that a thing can't be done. Simon Newcomb, the great astronomer and mathematician, proved by figures and the known laws of nature, to his own satisfaction and a good many others, that it was a physical impossibility to build a man-carrying airplane.

"Langley who was just as big a figure in the world of science believed that the thing could be done, built model after model that flew but when he built his big machine to be piloted by a man it fell before it got fairly into the air. Yet the same year that he failed, the Wright Brothers, a couple of bicycle mechanics,

put a gasoline engine in a glider and flew. Since then bombing airplanes have been built that will carry a ton or more.

“The moral is that if you must predict it is better to do so in favor of rather than against a proposition unless you’re betting on a horse. My opinion is that signaling to Mars will not be done by long electric waves set up by electric sparks. Some years ago Tesla, the electrician, was reported to have received signals from Mars by long electric waves, that is wireless waves, while Pickering the astronomer got up a plan to reflect signals to the red planet by short electric, that is light waves. All he needed to do it with was ten million dollars’ worth of mirrors and by forming these into a gigantic reflector he opined he could concentrate the light of the sun into a beam and throw it on the surface of Mars.

“And this puts me in mind of Tesla’s scheme to transmit power wirelessly. To transmit power to run machinery and to control power at a distance by wireless are two entirely different things. Since wireless waves tend to radiate in all directions parallel with the surface of the earth from an aerial, it is a very diffi-

cult matter to transmit enough energy wirelessly in any one direction to have a sufficient quantity left after it has passed through even a short distance to do useful work such as running a motor.

“As early as 1905 Tesla took out patents for a system of wireless transmission of power in which he proposed to use the free ether of space instead of the ether in and around a wire to guide and carry it. He built a great tower at Wardencliff, Long Island, New York, for the purpose of radiating power but nothing came of the experiments he made and after some years the tower was torn down.”

“You don’t believe then that it will ever be possible to transmit energy for power purposes by wireless?”

“On the contrary, I believe it is possible but other discoveries must be made before it can be done successfully and this is also true of many other things which have been and are still looked upon as physical impossibilities. As to controlling apparatus at a distance by wireless that is, of course, just as easy as sending a signal, in fact it’s the same thing.

“Tesla was the first to control the movements

of a boat at a distance by wireless and after him came many others. Even submarines have been so equipped and controlled but since the surface of the sea reflects most of the energy of the waves and absorbs the rest of it the boat must have its aerial above the surface at all times or the waves will not reach it.

“Attempts to control airships by wireless have been made time without number but to no useful purpose for no effective distance can be had between an airship and the sending station. Even sending wireless messages from airplanes as you said yesterday is only done over a very short distance and these limits are quickly reached because there is no way of grounding it.”

“How do you think the distance could be increased?” Jack wanted to know.

“You are asking a hard question, my boy. It might be done by finding a certain length of wave that would have a carrying capacity through the ether comparable to that of light, yet be longer than a light wave and shorter than the wireless waves we use for transmitting over land and sea. But this is sheer speculation on my part. Well, Jack, we’re all done and you

see it wasn't such a hard job as you thought. Before we go, though, I should like to know just what you expect to do in the future."

"Really, I don't know, Mr. Collins, though I've been thinking pretty hard about it lately, too. You see, I've reached an age where I've got to boil down to business and make some money, but I don't want any of that swivel-chair-at-a-desk-on-the-'steenth-floor-of-an-office-building for mine. I'd get into the airplane game but there's no more money in it than there is in wireless.

"My one best thought is to get a little party together, go down to Brazil and open up a diamond mine," and he looked fondly at the glittering stone in his ring.

"What I'd like to do is to get Bill Adams and a few other kindred spirits to go with me, clean out the Capunicas, and," his eyes brightened, "if you'll join us I'll make you King of the cannibals instead of old Oopla."

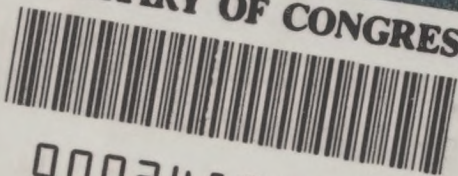
"Declined with thanks," I bowed regally, that is as regally as a man can bow whose back is already bent. "I haven't the slightest desire to king it over any tribe of man-eaters, but if you will let me go with you in the capacity of

adviser, medicine man and book-maker I'll consider it."

"Done, signed and sealed," said Jack and we shook hands till we should get together on the proposition.

THE END

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